The Influence of Preschool Teachers' Implementation Behavior on Children's Engagement and Literacy Growth Within a Phonological Awareness Intervention

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THE INFLUENCE OF PRESCHOOL TEACHERS' IMPLEMENTATION BEHAVIOR ON CHILDREN'S ENGAGEMENT AND LITERACY GROWTH WITHIN A PHONOLOGICAL AWARENESS INTERVENTION

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Abstract

Response to Intervention (RTI) in early childhood (EC) settings is emerging as an effective framework for improving early literacy outcomes of young children at risk for later reading difficulties. Within an RTI framework, Tier 2 early literacy interventions frequently consist of explicit instruction of phonological awareness (PA) skills with children identified as in need of additional support beyond what is offered in the general preschool curriculum. Factors that have been identified with enhancing children's engagement and learning within other evidence-based practices are teachers' fidelity of implementation of instructional practices and their use of strategies to guide children's behavior. The purpose of this study is to examine the effects of teachers' fidelity of implementation of evidence-based literacy strategies and the use of behavior management strategies on children's participation and early literacy outcomes during a Tier 2 PA intervention. Participants included 13 children at-risk for later reading failure across 5 preschool classrooms in an urban district. Results indicated that teachers' use of behavior management strategies appeared to influence children's active engagement and learning in addition to teachers' fidelity to instructional strategies. Future research is needed to determine the relationship between teachers' fidelity of literacy intervention and their use of behavior management strategies. Teachers should consider incorporating behavior management strategies into early literacy interventions in order to promote children's active engagement and learning and increase the potential for greater literacy outcomes.

Keywords: Early Literacy, Engagement, Behavior, RTI, Tier 2, Phonological Awareness

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CHAPTER 1

Overview: Introduction, Purpose, and Scope of Dissertation Research

Children's preparedness to enter school ready to learn has been a national focus for decades (Head Start Act, 1981; Improving Head Start for School Readiness Act of 2007; White House, 2013). Additionally, the demand for academic achievement in the elementary years has placed a stronger focus on the need for children to arrive at kindergarten ready to succeed. Reading achievement has been identified as a major component of school readiness and academic success, and has been the focus of several national initiatives (Goals 2000: Educate America Act, 1994; National Reading Panel, 2000). Furthering the work of these initiatives, several studies have documented the critical nature of specific foundational language and literacy skills prior to kindergarten entry as an important antecedent to reading proficiency in the elementary grades (Biemiller, 2006; C.J. Lonigan, Burgess, & Anthony, 2000; Sénéchal & LeFevre, 2002; Storch & Whitehurst, 2002; Whitehurst & Lonigan, 1998). The probability that children will be struggling readers throughout their school careers increases when they arrive at kindergarten with delays in language and early literacy skills (Biemiller, 2006). Furthermore, early reading difficulties place children at greater risk for economic and social failure in adulthood as a technological society increasingly demands higher levels of literacy from its workforce (Snow, Burns, & Griffin, 1998).

As a result of the increased awareness of the importance of developing early literacy skills, much research has been conducted to identify and develop effective strategies and interventions, programs, and curricula (i.e., evidence-based practices) to improve early language and literacy outcomes in young children (Assel, Landry, Swank, & Gunnewig, 2007; Dunst, Simkus, & Hamby, 2012; Han, Roskos, Christie, Mandzuk, & Vukelich, 2005; National Early

Literacy Panel, 2008; U.S. Department of Education, 2007, 2008). An increasingly common framework for implementing strategies to improve literacy outcomes in elementary grades is Response to Intervention (RTI) or Multi-Tiered Systems of Support (MTSS) (Al Otaiba & Fuchs, 2006; Berkeley, Bender, Peaster, & Saunders, 2009; Fuchs & Fuchs, 2006; Fuchs & Young, 2006; Walker & Shinn, 2010). RTI/MTSS (herein referred to as RTI) is a problem-solving approach to instruction wherein the intensity of instruction increases as a child moves through tiers, and learner needs are assessed through the use progress monitoring measures (Fuchs & Fuchs, 2006). As an example, all children receive universal or Tier 1 instruction. If a child does not respond to universal instruction as measured by progress monitoring, then the child is provided Tier 2 instruction, whereby intervention is targeted and the child is given more opportunities to respond and receive feedback on specific content areas. If the child is still unresponsive to instruction as measured by progress monitoring, individualized or Tier 3 instruction is provided.

The RTI framework is emerging in early childhood settings, and has potential to be a successful strategy for programs and teachers to provide instruction responsive to children's needs in diverse inclusive settings (Greenwood et al., 2011; Greenwood et al., 2013). Additionally, the Committee on the Prevention of Reading Difficulties in Young Children suggests that the use of an RTI framework in early childhood is a promising strategy to increase the effectiveness of existing models of literacy instruction in early childhood settings (Snow, et al., 1998). While the potential effectiveness of an RTI framework for providing early literacy instruction within a preschool setting has been noted, little is known about the specific instructional and behavior management strategies used by preschool teachers when they are implementing early literacy interventions and how those strategies enhance children's active

engagement and improve their literacy outcomes. Therefore, the purpose of this study is to examine the effects of preschool teachers' fidelity behaviors on children's correct responding, on-task behavior, and early literacy outcomes during a Tier 2 phonological awareness (PA) intervention.

One important link between evidence-based practices and positive child outcomes is teachers' fidelity of implementation (Odom, 2009). Five aspects of implementation fidelity have been identified: (a) *adherence*, or the extent to which practices/interventions were implemented as intended; (b) *dosage*, or an index describing children's exposure to interventions; (c) *quality of delivery*, or a measure of aspects of practices that are not directly related to implementation of the intended content, such as teacher preparedness, enthusiasm, and attitudes; (d) *participant responsiveness*, a measure of participant response to interventions that could include a measure of the level of participation or enthusiasm; and (e) *program differentiation,* or a manipulated check to ensure that participants only received planned interventions (Dane & Schneider, 1998; Knoche, Sheridan, Edwards, & Osborn, 2010). These five aspects have been summed up as fidelity to structure, and fidelity to process (Knoche, et al., 2010; O'Donnell, 2008). Research documents that differences in implementation fidelity of prevention and health promotion programs for children and adolescents generally produce corresponding differences in outcomes (Durlak, 1998; Dusenbury, Brannigan, Falco, & Hansen, 2003), but what is less understood is how the different aspects of implementation fidelity of an early literacy intervention correspond to preschool children's participation and their early literacy outcomes.

Measuring child engagement and correct responding in an intervention can provide understanding of how participant responsiveness, a factor in fidelity to process, affects intervention outcomes. Child engagement has long been identified as an important moderator of

learning for all children (Blasco, Bailey, & Burchinal, 1993; Casey, McWilliam, & Sims, 2012; de Kruif & McWilliam, 1999; Malone, Stoneman, & Langone, 1994; McWilliam & Bailey, 1995). For young children, engagement can be defined as child interactions with teachers, peers, and materials in developmentally and contextually appropriate ways (McWilliam & Casey, 2008). For the purpose of the current study, child engagement is defined as developmentally and contextually appropriate on-task behavior. Recently, researchers have begun to examine the influence of preschool children's engagement on growth in literacy and language skills, and research indicates that higher levels of instructional support in the preschool classroom are needed to promote child engagement and gains in literacy and language skills (Chien et al., 2010; Williford, Maier, Downer, Pianta, & Howes, 2013).

Children's behavior is another factor research identifies as affecting children's participation and the effectiveness of early literacy interventions (Nelson, 2003). In a meta-analysis of literature from 1976 to 2002, Nelson and colleagues (2003) highlighted the strong correlation between problem behaviors of children from preschool to third grade with the effectiveness of early literacy interventions, and suggested that children who exhibit problem behaviors are more likely to be nonresponsive to intervention efforts. More recent research has begun to emerge examining the association between child behaviors (e.g., problem behavior, social functioning) in small group instruction and outcomes on school readiness measures, including measures examining early literacy outcomes (Bulotsky-Shearer & Fantuzzo, 2011; Bulotsky-Shearer, Fantuzzo, & McDermott, 2010).

Bulotsky-Shearer and Fantuzzo (2011) examined the influence of situational behaviors (e.g., free play, structured learning situations) of preschool children on literacy and language skills in kindergarten and first grade for urban Head Start children (N = 2682). Researchers

found that problems in structured learning situations were negatively correlated with cognitive skills at the end of the preschool year and literacy outcomes in both kindergarten and first grade. Additionally, problems during peer and teacher interactions predicted lower phonological awareness skills at the end of first grade. While current research suggests a link between child behavior and early literacy, additional work is needed to understand what strategies teachers use during structured learning situations, such as Tier 2 targeted phonological awareness interventions. Additional examination of Tier 2 PA interventions is needed to understand how teachers promote participation and positive child interactions and behaviors, how often strategies are implemented, and how implementation of strategies is related to on-task behavior and early literacy outcomes in preschool children.

Review of Literature

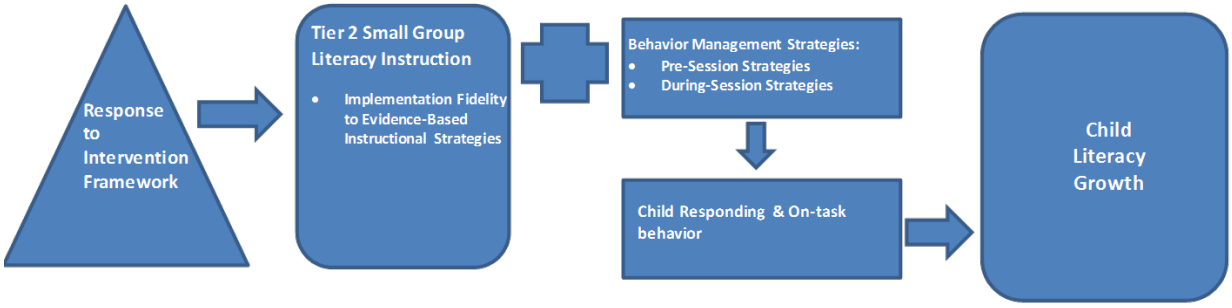
A review of the literature is discussed in Chapter 2 and provides an overview of empirical studies relevant to phonological awareness interventions in preschool settings. The chapter begins with a description of the use of Response to Intervention in preschool settings, followed by a discussion of Tier 2 and small group phonological awareness instruction, teachers' fidelity of implementation of intervention strategies, teachers' use of behavior management strategies, and child engagement. Following this is a discussion on how these factors relate to literacy growth in at-risk preschool children.

Research Study

While separate bodies of research examine factors such as direct instruction of skills relating to phonological awareness in preschool children, teachers' fidelity of implementation, and how child behavior and engagement relates to academic outcomes, this study is an attempt to bring these concepts together and examine how these factors affect preschool children's literacy

growth. This study was conducted within the context of a randomized trial with the Center for Response to Intervention in Early Childhood (CRTIEC), examining the effects of a Tier 2 PA intervention on children's growth in PA skills. Five classrooms in which teachers were trained to implement the PA intervention were observed for the purpose of this study. The goal of the PA intervention was to help children acquire and strengthen PA skills, and teachers were not provided with training on implementing behavior management strategies during the PA intervention. The intervention manual provided to teachers suggested delivering a consistent introduction prior to daily intervention session activities in order to address children's behavior expectations, but it was not scripted. Further, no guidance on specific during-session behavior management strategies (e.g., tone of voice, using children's names, nonverbal feedback, descriptive feedback) were provided as part of the *PA Path to Literacy* intervention. Given that guidance to teachers was focused on implementation of literacy strategies, considerable variation was anticipated in the extent to which teachers used behavior management strategies both before and during intervention sessions. Differences were also expected in how well teachers were able to evoke children's active responding and on-task behavior during intervention activities. Figure 1 graphically depicts how teachers' implementation differences could influence children's literacy outcomes within an RTI framework.

Figure 1. Influence of teachers' fidelity behaviors on child literacy outcomes.



Thus, the current study extended CRTIEC's work by analyzing differences in teachers' fidelity of implementation of instructional strategies and use of behavior management strategies during the Tier 2 PA intervention, and examining how those differences relate to children's correct responding and on-task behavior during intervention sessions, and children's early literacy outcomes. A descriptive design was used, employing single subject methodology (Kennedy, 2005) including visual analysis to describe how teacher behaviors affected child behaviors and literacy outcomes across children and classrooms. The methodology of this study is discussed in Chapter 3, including a description of participants, setting, and measurement. Results are discussed in Chapter 4 and implications in Chapter 5.

CHAPTER 2: Literature Review

Response to Intervention in Early Childhood

For students in K – 12 settings, the No Child Left Behind Act (No Child Left Behind Act of 2001) and the Individuals with Disabilities Education Improvement Act (Individuals with Disabilities Education Act of 2004) support use of an RTI framework by highlighting the importance of improving student outcomes through use of evidence-based practices. Though use of RTI in early childhood (EC) is not explicitly addressed in federal legislation, there are several initiatives that require early childhood personnel to monitor and report outcomes of young children, which is a key feature of RTI. In 2005, the Office of Special Education Programs (OSEP) began requiring state Early Intervention and Preschool Special Education programs to report child outcomes using a measurement process (ECTAC, 2014). Likewise, the Improving Head Start for School Readiness Act of 2007 supports an RTI framework by requiring programs to report child outcomes (Improving Head Start for School Readiness Act of 2007). These federal initiatives include a focus on outcomes and serve as a way to ensure that young children receive appropriate services and supports in order to meet their educational needs early or prior to their formal academic career. Given that RTI is used for this purpose of meeting students' needs in a timely manner in K – 12 settings, it is a promising framework for use in early childhood settings as well.

In response to the current national focus on improvement of outcomes through early intervention and monitoring services and supports for young children, a joint paper on RTI in early childhood was generated by the three major national early childhood professional organizations: the Division for Early Childhood (DEC), the National Association for the Education of Young Children (NAEYC), and the National Head Start Association (NHSA). This

document defines key features of RTI for implementation in early childhood settings, describes common myths about RTI in early childhood, and explains future directions of research and practice in early childhood as related to RTI (DEC, NAEYC, & NHSA, 2013).

Research is beginning to emerge demonstrating that applying an RTI framework in early childhood settings can lead to improved child outcomes. Gettinger and Stoiber (2008) implemented an RTI framework with a multi-tiered intervention program (i.e., the Exemplary Model of Early Reading Growth, EMERGE) to improve early literacy outcomes among low-income children. EMERGE was implemented in 15 classrooms across five center-based early childhood programs using the key features of an RTI framework: (a) scientifically-based comprehensive early literacy curriculum, instruction, and activities presented across a three-tiered hierarchy of increasing intensity of intervention, (b) screening and ongoing progress monitoring to inform decision-making, (c) high-quality and literacy-rich classroom environments, and (d) ongoing professional development, literacy coaching, and collaborative planning. Instruction included adapting strategies to children's needs and specifically focused on Alphabet Knowledge, Sound Awareness, Oral Language, and Print Awareness, and Theme-Related Activities that related to the curriculum thematic content. Following one year of implementation, comparisons of child performance between intervention and control classrooms on early literacy outcome measures suggested that use of the multi-tiered framework of instruction and intervention was associated with higher performance on these measures.

Though the research base is not yet robust, applying an RTI framework is emerging as an effective strategy for improving language and early literacy outcomes for low-income children and those at-risk for later reading difficulties(Greenwood, et al., 2013). Additional research is needed to support the use of an RTI framework in improving early literacy outcomes of young

children. Furthermore, future research should address effective instructional strategies within each tier of instruction to improve language and early literacy outcomes of young children at-risk for later reading difficulties. Research should also document how teachers implement strategies and how their implementation influences intended child outcomes.

Tier 2 Literacy Instruction

Phonological awareness (PA) has long been a target skill in early literacy interventions as delays in this area have been linked to later reading disability (Justice & Kaderavek, 2004; Snow, et al., 1998; Torgesen, Wagner, & Rashotte, 1994). When implementing an RTI framework to improve early literacy outcomes such as children's PA skills, Tier 2 instruction should increase the number of opportunities for children to respond to instruction of specific skills, and be delivered in small, homogenous groups of children (Justice, McGinty, Guo, & Moore, 2009). The Center for Response to Intervention in Early Childhood (CRTIEC) recently completed a series of studies validating Tier 2 early literacy interventions with the use of at least four evidence-based practices for improving children's early literacy outcomes: differentiated, explicit instruction; increased opportunities for responding; individualization and accommodations for children with disabilities: and the use of strategies feasible for implementation in preschool classrooms (Greenwood, et al., 2011; Greenwood et al., 2012; Kong, 2013; Spencer, Goldstein, & Kaminski, 2012; Spencer et al., 2012). Evidence of the effectiveness of these Tier 2 intervention strategies have been tested using single case design, randomized control trials (RCT), and some are currently being conducted to support the efficacy of intervention strategies (Spencer, Goldstein, Sherman, et al., 2012).

Explicit instruction is a strategy commonly used to enhance PA skills in young children by providing specific opportunities for children to gain skills on a regularly scheduled and

carefully planned basis (Justice & Kaderavek, 2004). Research documents that preschool children with or at-risk for language delays benefit from an explicit and systematic instructional approach to PA instruction (Botts, Losardo, Tillery, & Werts, 2014). Explicit, or direct instruction includes highly-structured and teacher-directed prompts and responses, along with specific correction procedures (Gersten, Woodward, & Darch, 1986). Key features of explicit PA instruction include sequencing, modeling, and explaining a specific task; scaffolding of instruction; clear and consistent articulation of letter sounds and spacing between sounds during segmenting and blending activities, and providing corrective feedback (Phillips, Clancy-Menchetti, & Lonigan, 2008). Given that explicit PA instruction can be delivered in small groups of children to increase children's opportunities to respond, an explicit approach to teaching PA skills to young children can be used within an RTI framework in EC settings to improve early literacy outcomes for young children at-risk for later reading difficulties.

Results from small-scale studies examining the effects of Tier 2 PA interventions on PA skills are beginning to emerge. Several studies have investigated the effectiveness of interventions designed to increase phonological awareness and have documented positive results in preschool children at-risk for later reading difficulties. Koutsoftas, Harmon, and Gray (2009) examined the effectiveness of a Tier 2 intervention designed to increase beginning sound awareness of 34 low-income preschoolers in 5 Early Reading First (ERF) classrooms. The intervention was effective for 71% of the children, as evidenced by medium to large effect sizes. Comparisons of outcomes on early literacy measures between children who did and did not qualify to participate in the Tier 2 intervention indicated that the gap in beginning sound awareness began to narrow upon introduction of the intervention. Further, scores were sustained over time, as evidenced by outcome measures assessed in kindergarten. All interventionists (n =

4) were experienced teachers or Speech-Language Pathologists (SLPs), trained to follow scripts and administer intervention probes, met weekly to practice implementation, and implemented the intervention with 100% treatment fidelity. While results from this study indicate that the Tier 2 intervention was effective in improving early literacy outcomes and the results were sustained over time, effect sizes of the intervention varied, ranging from .61 to 1.94. In addition, effect sizes were not computed for three children due to scores of 0 on outcome measures at baseline and post-intervention. This suggests that some children did not respond as well to intervention strategies as other children, indicating a need to investigate specific child and teacher characteristics, as well as aspects of implementation beyond adherence to procedures of a scripted intervention that may affect correct responding, on-task behavior, and early literacy outcomes.

Similarly, Lonigan, Purpura, Wilson, Walker, and Clancy-Menchetti (2013) recently evaluated the efficacy of various combinations of phonological awareness instruction, dialogic reading, shared book reading, and a control group of at-risk preschool children. Intervention groups consisted of 3 – 5 at-risk children each, occurred five days a week across the school year for approximately 10 to 20 min each day, though the PA and the letter knowledge intervention did not begin until January, and lasted 12 weeks. Intervention groups were pull-out sessions (i.e., children were removed from the classroom) and activities were delivered by trained interventionists who were supervised throughout the year by experienced interventionists, though fidelity data was not reported. Results indicated that children who received the PA intervention scored significantly higher on PA outcome measures than children who did not participate in the PA intervention. Across activities, children who participated in the interventions experienced more early literacy growth than those who only received the general curriculum, providing

additional evidence of the effectiveness of skill-specific explicit PA instruction. However, this study did not report a measure of implementation fidelity, nor were intervention activities conducted in the classroom by classroom teachers. Child-level factors such as correct responding or on-task behavior were not measured, nor were differences in implementation among interventionists. It is crucial to investigate the efficacy of Tier 2 PA interventions within a preschool classroom, conducted by classroom teachers.

To further understanding regarding PA interventions taking place within preschool classrooms, Ziolkowski and Goldstein (2008) conducted an intervention study to investigate the effectiveness of an explicit PA intervention within repeated shared book reading (SBR) with low-income preschoolers with language delays. In this study, all 13 children who participated in the intervention activities demonstrated improvement in PA skills and large effect sizes were reported. While interventions were delivered in the children's preschool classroom, instruction was provided by trained graduate students rather than classroom teachers, leaving the question of efficacy when intervention is delivered by classroom teachers. Child-level differences such as correct responding, on-task behavior, and how these relate to child outcomes were not reported in this study. While implementation fidelity was measured across this study and ranged from 94.8 to 100% across intervention conditions, fidelity was reported as adherence to required treatment protocol and number of PA trials presented. No specific differences among interventionists were reported, nor was there a component measuring use of behavior management strategies.

Bailet, Repper, Piasta, and Murphy (2009) also measured implementation fidelity in their study examining the effectiveness of an explicit early literacy intervention for 220 prekindergarten children at risk for later reading failure. Further, a measure of behavior

management was included, such as the interventionists' ability to establish rapport, regulate child attention and behavior, and provide positive verbal feedback. Lessons teaching phonological awareness skills were delivered twice weekly in children's classrooms across 9 weeks by teachers hired and trained specifically to implement the intervention. Elements incorporated in lessons included large-muscle movements, multisensory materials, activities, and repetition within and across lessons and intervention routines. Effect sizes were small to medium for each measured outcome across this study. However, the authors reported procedural fidelity to "indicate high standardization" but "some variability was likely" (p. 350) and described this as a limitation of the study, suggesting a need for further investigation of which teaching characteristics (e.g., instructional, behavior management) are most strongly associated with higher child outcomes

One recent study of the effectiveness of a Tier 2+ PA intervention by Noe and colleagues focused specifically on children who had previously not demonstrated growth in response to a Tier 2 PA intervention and also included a review of behavior expectations and provision of rewards for child compliance (Noe, Spencer, Kruse, & Goldstein, 2013). In this study, research staff implemented an automated storybook intervention with embedded explicit PA instruction. Implementation fidelity of eight instructional components including both adherence to literacy and behavior management strategies (e.g., stating the rules, correctly reading the story and script, provision of feedback, providing reinforcement) was measured in 20% of intervention sessions and was reported to be 100% across sessions. Upon completion of the intervention, five of the seven children made significant gains on early literacy measures, suggesting that adhering to literacy and behavior management strategies during small group intervention activities were effective in improving some children's PA skills. However, two of the children did not make

significant growth in skills, indicating a need to investigate specific strategies that affect children's literacy gains. Questions regarding differences in how classroom teachers' use of behavior management strategies during Tier 2 PA instruction affect child correct responding, on-task behavior, and early literacy outcomes remain to be answered.

Thus, current research demonstrates the effectiveness of small-group PA interventions on early literacy growth in young children at risk for later reading difficulties, and additional evidence is beginning to emerge documenting the effectiveness within an RTI framework. However, it is imperative to conduct future research investigating several areas in need of greater understanding related to small group PA interventions. First, research should focus on fidelity of implementation when scripted PA interventions are led by classroom teachers instead of research staff or trained interventionists. It is critical to know how well preschool teachers adhere to scripted procedures and how fidelity affects child participation and outcomes. Second, future research should examine contributions teachers make to implementation outside of what is scripted, such as use of behavior management strategies or other strategies to gain and sustain high levels of child engagement, and how those contributions affect child participation and outcomes. Third, researchers should investigate how children participate in Tier 2 PA intervention; respond to explicit instruction; and how participation and responding affects outcomes. This type of research would provide greater understanding of how to design interventions that promote maximum participation and increase opportunities for early literacy growth.

Teachers' Implementation Fidelity

In education research, fidelity of implementation describes how well teachers implement an intervention as intended by its developers (Pence, Justice, & Wiggins, 2008) and is an

important link between evidence-based practices as positive outcomes (Odom, 2009). One recent study has examined the specific relationship between preschool teachers' implementation fidelity and early literacy outcomes. Hamre and colleagues (2010) examined the extent to which three aspects of teachers' implementation fidelity (i.e., adherence, dosage, quality) of My Teaching Partner, an explicit and systematic language and literacy supplemental curriculum, were associated with children's growth on early literacy outcomes during the preschool year. Participants included 154 teachers and 680 children considered at-risk for later academic difficulties. Hierarchical Linear Modeling results indicated that differences in teachers' adherence to curriculum procedures did not produce corresponding differences on children's early literacy scores. However, higher quality of implementation (i.e., teachers' use of evidence-based literacy and language specific teaching strategies during implementation of the curriculum), as measured through observed teacher-child interactions, produced greater early literacy outcomes. This work suggests that teachers' adherence to the intervention may not have been the only active ingredient resulting in early literacy gains in preschool children. Thus, examining strategies that teachers may implement beyond those prescribed during intervention may provide a greater understanding of factors that predict growth in children's early literacy skills.

Though not reporting how fidelity specifically related to literacy outcomes, Powell and Diamond (2013) investigated the implementation fidelity of a coaching based professional development program for teachers from Head Start, using a hybrid model of face-to-face classroom visits, video-based coaching, and viewing practice videos. The goal of the professional development program was to improve vocabulary and phonological awareness of preschool children living in poverty.

Analysis of implementation fidelity of 45 teachers participating in the professional development program included investigating features of *structure* (i.e., organizational arrangements for the coach to observe classroom practices and provide feedback on evidence-based practices), *process* (i.e., actions used to promote use of evidence-based practices), and *content* (i.e., evidence-based practices implemented by teachers to promote targeted child outcomes). Results indicated that the intervention was implemented as intended, as there was near full compliance with coaching procedures across the intervention activities (e.g., number of coaching sessions, type and length of feedback, discussion of evidence-based literacy practices, hybrid model of coaching). However, the amount of time spent watching online resources and modules was highly variable across teachers, suggesting that teachers with higher levels of implementation fidelity of instructional strategies may need different coaching supports than those with fewer skills. Authors reported that it is imperative that the first step in improving teacher implementation fidelity is an understanding of the multiple dimensions involved in coaching teachers.

Sutherland, McLeod, Conroy, and Cox (2013) have provided definitions and descriptions of four "treatment integrity dimensions" and a description of how each can be used to measure integrity of teacher-provided interventions for young children with emotional and behavior disorders. Sutherland et al. (2013) label the four dimensions as (a) *treatment adherence*, or the extent to which a teacher delivers the intervention as intended, (b) *treatment differentiation*, or evaluates how much teachers deviate from the prescribed program, (c) *competence*, or quality of delivery of the intervention, and (d) *relational factors*, or a focus on how well the intervention is received by the children. It is important to note that the authors included relational factors in their definition of treatment integrity (i.e., implementation fidelity) because:

> "adherence to an EBP protocol is not sufficient if a child does not participate in the program…a program that actively engages a homogeneous sample of children may fail to engage a more diverse sample of children that may be found in typical early childhood classrooms. Simply focusing on whether the technical aspects of an EBP are delivered therefore my miss important information needed for interpreting study findings (e.g., the EBP failed to engage the children so the delivery of the program needs to be modified)" (Burchinal, Howes, & Kontos, 2002), pp. 136.

In summary, limited research examines implementation fidelity as related to early literacy outcomes, as the field of implementation science continues to emerge in the field of early childhood research and practice. Further, when measuring implementation fidelity of evidence-based practices in early childhood classrooms, it is imperative that relational factors be considered, especially when providing instruction to children at-risk for poorer developmental and academic outcomes. Within an observation of teachers' fidelity, a measure of teachers' behavior management strategies may provide a first look at relational factors that affect how an evidence-based practice is implemented and received, as well as how they affect child participation and desired child outcomes.

Teachers' Behavior Management Strategies

While a link between child behavior and emergent literacy has been documented (Girard & Girolametto, 2013; C.J. Lonigan et al., 1999; McClelland et al., 2007; Ponitz, McClelland, Matthews, & Morrison, 2009), and there is a clear connection between effective behavior management and positive child behavior (Arnold, McWilliams, & Arnold, 1998; Kim, Stormont, & Espinosa, 2009; Webster-Stratton, Reid, & Hammond, 2001; Webster-Stratton, Reid, & Stoolmiller, 2008), there is a surprising lack of studies examining the relationship between preschool teachers' behavior management strategies and children's academic outcomes, including early literacy outcomes. This is especially concerning given that research suggests that children with difficulty in structured learning situations (i.e., small group, teacher-directed)

demonstrate poor early literacy outcomes and are at risk of later reading difficulties (Bulotsky-Shearer & Fantuzzo, 2011; Bulotsky-Shearer, Fernandez, Dominguez, & Rouse, 2011).

Dobbs-Oates and colleagues (2011) have addressed this gap in research by examining the relations among preschool teachers' behavior management strategies, children's task orientation, and children's emergent literacy and language development. Task orientation was defined as the ability to demonstrate perseverance and emotional control in constructive and social activities (Dobbs-Oates, et al., 2011; Gruber, 1954). Participants were 398 children from low-income backgrounds and 67 preschool teachers, all from a larger study of training teachers to include print-referencing behaviors during in-class storybook reading (Justice, Kaderavek, Fan, Sofka, & Hunt, 2009). Teachers' behavior management strategies measured over the course of the year were positively related to children's print awareness development, and children's task orientation was also positively related to their print awareness development. Teachers' use of behavior management strategies was not significantly related to children's task orientation. Authors concluded that behavior management is necessary for the development of print awareness.

While the association between preschool teachers' behavior management and children's early literacy growth has received little attention in the literature, research examining this construct has been conducted with children in early elementary school. In a study investigating relationships among student attention behaviors, teacher practices, and beginning word reading skills, Saez and colleagues (2012) suggested that high levels of teachers' behavior management were positively associated with outcomes on measures of word reading. In this study, participants included 432 kindergarteners and 32 teachers from 10 schools within one district who were part of a larger RCT examining response to literacy instruction. Outcome variables in this study were derived from measures of child attention behaviors, phonological awareness

skills, word reading, vocabulary knowledge, and literacy instructional practices. The measure of literacy instructional practices was a checklist rating the effectiveness of teacher practices for task orienting, behavior management, individualizing instruction, and teacher re-directing of off-task behaviors. Researchers found that on average, highly consistent and clear behavior management was associated with better word reading performance. Further, teacher use of re-directs negatively interacted with attention-memory in predicting kindergarten word reading. Authors suggested, "By regulating students' attention to upcoming instructional events, acceptable behavior for maximizing learning, and manageable practice activities to support learning, teachers guide student focus, thereby structuring and enhancing learning opportunities" (p. 12). This study provides preliminary evidence of a relationship between teachers' behavior management and children's attention and early literacy outcomes at the kindergarten level. To date, however, studies such as this have not been carried out in pre-kindergarten settings.

An early qualitative study (Wharton-McDonald, Pressley, & Hampston, 1998) observed characteristics of first-grade teachers considered to be outstanding in literacy instruction, as nominated by school language arts coordinators. Three teachers considered to be highly effective, as determined by nomination and qualitative measures of student achievement, were compared to six teachers considered to provide typical literacy instruction. After conducting observations and interviews and collecting classroom artifacts (e.g., students' writing journals, lists of classroom books, homework assignments), indices of student achievement were created according to students' reading levels, writing levels, and engagement during literacy activities. One of the characteristics that emerged consistently across the teachers considered to be highly effective was "masterful classroom management," which included preventing misbehavior, and managing time, activities, and student interactions. Each teacher described the importance of

planning and following predictable routines, and teachers employed predictable and consistent behavior expectations and consequences. Authors stated, "For the most part, teachers minimized disruptive behavior by preventing it before it could occur. Often, these teachers were able to redirect students' behavior in a positive way without resorting to criticism or punishment" (pp. 120-121). This study contributes to understanding of factors important in effective literacy instruction and suggests that effective behavior management, especially delivery of pre-session expectations and positive strategies, should not be overlooked when providing literacy instruction. At this point, no similar studies have been conducted examining the effects of different types of teachers' behavior management strategies on children's early literacy outcomes.

In summary, current research documents a link between child behavior and early literacy outcomes, as well as teachers' behavior management and child behavior. Some research exists documenting a possible relationship between teachers' behavior management and children's early literacy outcomes at the kindergarten and first-grade level. However, there is a lack of research examining the effects of preschool teachers' behavior management and children's early literacy outcomes. This is concerning, given the national focus on improving early literacy outcomes, especially for young children at risk of later reading failure. Therefore, it is critical to conduct research examining what behavior management strategies preschool teachers employ during small group literacy instruction, differences in behavior management across teachers, and how these relate to children's correct responding, on-task behavior, and early literacy outcomes.

Child Engagement

Recently, researchers have begun to examine the influence of preschool children's engagement on growth in language and early literacy skills. Missall, McConnell, and Cadigan

(2006) examined correlations between literacy skill growth and percent of time children were engaged during teacher-directed activities, as measured by the Ecobehavioral Systems for the Complex Assessment of Preschool Environments (ESCAPE, Carta, Greenwood, & Atwater, 1985). Results indicated literacy skill growth for children with speech-language disabilities was highly correlated with engagement in literacy-focused activities, including explicit instruction and listening to a story. While correlational in nature, findings indicate that the early literacy growth trajectories of young children with speech-language disabilities may be influenced by the time spent actively engaging with activities and materials related to early literacy.

An additional study (Chien, et al., 2010) used latent class analysis to classify predominantly at-risk preschool children into profiles based on their engagement in observed activities in the classroom. Children's language and literacy gains across the pre-kindergarten year were then predicted based on profile group membership. Four profiles of children with distinct patterns of child engagement were revealed based on amount of time spent in each type of activity: free play, individual instruction, group instruction, and scaffolded learning. In other words, a child's engagement profile was determined to be "free play" if the child spent the majority of the observed time in free play, and a child's engagement profile was determined to be "individual instruction" if the child spent the majority of the observed time in individual instruction. Time spent engaged in classroom activities was measured using the Emerging Academics Snapshot (Ritchie, Howes, Kraft-Sayre, & Weiser, 2001). Across the four profiles of children's engagement, significant differences were reported on measures of early literacy. Children who spent more time engaged in scaffolded and individual instruction made greater gains on early literacy outcome measures across the prekindergarten year. Children in the free play profile (i.e., children who spent the most time in free play) made the smallest gains in

language and literacy when compared to the other three profiles (i.e., individual instruction, group instruction, scaffolded learning), indicating that higher levels of instructional support in the preschool classroom are needed to promote child engagement and gains in literacy and language skills. Thus, this study provides evidence that at-risk children's growth on early literacy outcomes may be influenced by engagement in specific instruction.

Williford and colleagues (2013) examined the combination of child engagement and teachers' classroom-level interactions in predicting school readiness components, including emergent literacy. The sample of 605 children in this study consisted primarily of children eligible for state- and federally- funded preschool programs due to low income or developmental delay. Researchers used the *Individualized Classroom Assessment Scoring System;* (inCLASS*;* (Downer, Booren, Hamre, Pianta, & Williford, 2011) to measure children's classroom engagement in interactions with teachers, peers, and tasks, and children's outcome measures included the *Peabody Picture Vocabulary Test* (Dunn & Dunn, 1997) and the *Test of Preschool Early Literacy* (TOPEL, Lonigan, Wagner, Torgesen, & Rashotte, 2007). Three child profiles emerged from latent profile analysis:

1. Typically engaged: characterized by relatively low positive engagement with teachers and peers, moderate engagement with tasks, and low negative engagement
2. Positively-engaged: significantly higher positive engagement with teachers, peers, and tasks, and significantly lower negative engagement when compared to the Typically-Engaged profile
3. Negatively-engaged: lower task engagement and higher negative engagement compared to the Typically-Engaged profile.

Results of the multi-level modeling indicated significant gains in expressive vocabulary associated with membership in the positively-engaged profile, while significantly smaller gains in print knowledge were associated with membership in the negatively-engaged profile. Results revealed both individual child engagement and the quality of teacher-child interactions at the classroom level uniquely predicted children's school readiness skills. These studies provide evidence suggesting that child engagement in early literacy instruction and activities contributes to literacy growth across the preschool year. What continues to be unknown is if teachers implement specific strategies to promote engagement and on-task behavior, what those strategies are, and if they are related to early literacy outcomes.

In summary, research has begun to emerge supportive of employing an RTI framework in early childhood settings. Implementing small-group PA interventions are effective in improving early literacy skills of preschool children when children are provided with evidence-based literacy strategies such as explicit, skill-focused instruction. Additionally, this type of intervention is compatible within an RTI framework. Teachers' fidelity of implementation is an important link between evidence-based practices and improving child outcomes, but much work is needed to illuminate how various aspects of fidelity affect child participation and outcomes. What is not fully understood are what specific components of a prescribed intervention beyond that which is scripted that are necessary to further improve child outcomes. Further, while there is a clear link between child behavior and early literacy outcomes, there is a lack of research examining strategies teachers implement to manage child behavior and how teachers' use of these strategies relates to children's on-task behavior and early literacy outcomes. This study begins to address the gap in literature by describing the type and frequency of strategies teachers implement beyond what is provided in a scripted Tier 2 PA intervention and how these strategies

are related to children's correct responding and on-task behavior during intervention sessions and their scores on early literacy outcome measures. The findings from the previously discussed literature led to the hypothesis that children who are exposed to Tier 2 PA instruction led by teachers who exhibit greater percentages of implementation fidelity and have increased use of behavior management strategies will exhibit higher on-task behavior and greater early literacy outcomes. Therefore, a descriptive design was used to investigate differences in teacher implementation fidelity of literacy strategies, teachers' use of behavior management strategies immediately prior to and during intervention sessions, and how these factors influenced child engagement and growth on early literacy measures within a Tier 2 PA intervention. To advance what is known about what teachers are doing to promote positive behaviors in small group instruction and how this relates to children's correct responding and on-task behavior in a Tier 2 PA intervention and outcomes on early literacy measures, this study addressed five specific research questions:

1. What is the mean and range of teachers' use of literacy and behavior management strategies within *PA Path to Literacy*, as measured by the following:
    a. fidelity of implementation of instructional strategies during *PA Path to Literacy,* as measured by an implementation checklist
    b. percentage of total behavior management strategies implemented, as measured by direct observation
    c. percentage of pre-session, during-session, and reactive behavior management strategies implemented, as measured by direct observation?
2. What is the mean percentage of children's responding and on-task behavior within and across classrooms?

3. Does children's percentage of correct responding within the *PA Path to Literacy* covary with the following teachers' behaviors:
    a. fidelity of implementation of instructional strategies during *PA Path to Literacy*
    b. percentage of total behavior management strategies implemented
4. Do children's rates of on-task behavior within *PA Path to Literacy* covary with the following teachers' behaviors:
    a. fidelity of implementation of instructional strategies during *PA Path to Literacy*
    b. percentage of total behavior management strategies implemented
5. Does children's growth on early literacy outcomes, as measured by *First Sound Fluency, Word Parts Fluency, Letter Naming, and Letter Sounds*, covary with the following teachers' behaviors:
    a. fidelity of implementation of instructional strategies during *PA Path to Literacy*
    b. percentage of total behavior management strategies implemented

CHAPTER 3: Method

CRTIEC Study

The current study was an extension of a larger, ongoing efficacy study of a Tier 2 PA intervention from the Center for Response to Intervention in Early Childhood (CRTIEC) being carried out in Ohio, Florida and Kansas/Missouri. This larger study was a Cluster Randomized Comparison group design across the three sites; 40 prekindergarten classrooms were randomly assigned to either teacher-implemented *PA Path to Literacy* (phonological awareness) intervention or *Story Friends* (vocabulary/comprehension) comparison condition. The goal of the *PA Path to Literacy* intervention was to help children learn to phonetically manipulate words and to teach children the meta-linguistic concept of phonology. Instruction within the intervention was focused on letter-naming, letter-sound identification, and phonological awareness skills (i.e., blending, segmenting, first-sound identification). The 12 units of intervention lessons were designed to be delivered to small groups of children (i.e., 2 – 3 children) identified with deficits in early literacy and to provide children with additional opportunities to respond and receive feedback on phonological awareness instruction. The scope and sequence of *PA Path to Literacy* lessons are found in Appendix A.

In the Kansas/Missouri location, recruitment for the larger study was carried out in classrooms in the Kansas City, Kansas and Parkhill, Missouri school ditricts. Permission was sought from district administration, then the preschool program administrators, and then teachers from classrooms containing children considered at-risk for later reading difficulties. Research staff conducted recruitment meetings with administrators and teachers at each school, whereby information about the CRTIEC study was provided, along with an introduction to the intervention activities and research requirements, and a time for questions. Teachers were then

asked to sign informed consent and begin assisting with the child recruitment process by sending home informed consent packets to parents of children in their classrooms. Parent consent was provided in English, and Spanish when necessary (see Appendix B for English Informed Consent).

In the Kansas/Missouri site, six classrooms were randomly assigned to the *PA Path to Literacy* intervention and six classrooms to the *Story Friends* vocabulary intervention. In each of the *PA Path to Literacy* classrooms, CRTIEC research staff identified three children (18 children total) with low phonological awareness skills (see the CRTIEC Year 6 Participant Selection Flowchart in Appendix C for a diagram of the selection of participants).

A multiple gating screening process was used to identify children who would be appropriate for the Tier 2 PA intervention. Screening for participant selection began approximately 4 to 6 weeks after the start of the school year and included two waves of screening, about four weeks apart. Individual Growth and Development Indicators (IGDIs, Bradfield, McConnell, Rodriguez, & Wackerle-Hollman, 2013; McConnell, Bradfield, Wackerle-Hollman, & Rodriguez, 2013), First Sound Fluency (Cummings, Kaminski, Good, & O'Neil, 2011), and Word Parts Fluency (Kaminski & Powell-Smith, 2011) measures were used to determine children's responsiveness to Tier 1 instruction in their classrooms. Following the two screening waves, children selected for the Tier 2 intervention participated in pre-testing, which included IGDI measures and the Phonological Awareness and Print Knowledge subtests of the *Test of Preschool Early Literacy* (TOPEL, et al., 2007) and the *Clinical Evaluations of Language Fundamentals-Preschool 2nd Edition* (CELF-P2, Wiig, Secord, & Semel, 2004). A summary of assessment measures used in the CRTIEC Year 6 study can be found in Appendix D. Criteria for participation in the Tier 2 PA intervention included children with low

phonological awareness skills but adequate language to participate in intervention activities. Children's progress was monitored midway through the intervention, post-testing occurred upon completion of the intervention, and maintenance testing occurred approximately two weeks after post-testing.

In Kansas/Missouri, teachers in the intervention condition were asked to complete three (and up to four) lessons per week. Each group participated in at least 24 and up to 36 lessons across 12 units, with each unit divided into three lessons (e.g., 1A, 1B, 1C). With the exception of the Unit 1 lessons, each lesson began with instruction in alphabet knowledge, followed by phonological awareness activities, and ended with data collection. The lessons were designed to last approximately 10 – 15 minutes each and take approximately 6 to 9 weeks to complete, depending on children's attendance, schedules, and children's mastery of skills. Classroom teachers and staff participating in the intervention attended a two-hour training provided by CRTIEC research staff. Training included watching two training videos, modeling an intervention lesson, participating in word segmentation practice, and completing a check-out quiz with satisfactory responses. Each preschool classroom in the two districts employed two classroom staff members (e.g., general education teacher, special education teacher, teacher assistant, or paraprofessional), and classroom staff independently chose who would conduct intervention sessions and were not asked to inform research staff of their implementation plans. In order to promote implementation fidelity, all teachers were observed by CRTIEC staff approximately one time per week and feedback was provided according to guidelines described on the *PA Path to Literacy Fidelity of Implementation Checklist* and *PA Path to Literacy Teacher Feedback Guidelines* (Appendix E). Additionally, members of the CRTIEC research

staff video recorded up to four sessions across the intervention to better understand how children participated in the activities.

IRB approval was obtained at the University of Kansas in Lawrence, Kansas. See Appendix B for the informed consent letters, approved by HSCL, for both parents of children and classroom teachers.

Participants

Children previously selected for participation in CRTIEC's ongoing Tier 2 intervention study were considered eligible for the current dissertation study if they met the following criteria: (a) they were in classrooms in the Kansas City, Kansas school district and randomly assigned to the *PA Path to Literacy* intervention condition, and (b) their parents provided consent for participation in video recording. Thus, up to three prekindergarten children in each of five classrooms previously assigned to the *PA Path to Literacy* intervention were eligible to participate in the current study (Total = 15 children, 5-10 teachers). Children (N = 3) from the Parkhill, Missouri site were excluded from the study so as to minimize the potential for differences in outcomes due to varying district instructional requirements.

Setting

Child participants from the urban Kansas City, Kansas (KCK) district attended state-funded prekindergarten programs in two schools where programs were provided for children who met specific criteria to be considered at-risk for later academic difficulties. At-risk as defined by the district as meeting any of the following criteria:

- child qualified for free meal program
- child had Migrant Status with Certificate of Eligibility on file with the State
- child had a parent without a high school diploma or GED

- was a child of family member on active military duty with corresponding paperwork
- child's custodial parent was unmarried at time of enrollment
- child had a referral from the Department for Children and Families
- child was developmentally or academically delayed based on assessments
- at least one parent was a teen when child was born.
- child me the Kansas State Department of Education criteria for Limited English Proficiency

The prekindergarten program in the Kansas City, Kansas school district was an inclusive half-day program offered four days per week and curricula utilized addressed language and early literacy development. The *PA Path to Literacy* intervention activities occurred within the prekindergarten classrooms during a time selected by the classroom teaching staff.

Measurement

Teachers' Implementation Fidelity. Fidelity of teachers' implementation of instructional strategies within *PA Path to Literacy* were derived from data collected as part of the larger CRTIEC study. The *PA Path to Literacy Teacher Fidelity of Implementation Checklist* (see Appendix E for a portion of the checklist), developed by CRTIEC research staff, was used to record whether teachers implemented instructional strategies and intervention procedures considered critical features of *PA Path to Literacy*. Direct observation of the teachers' fidelity of implementation was carried out by trained observers approximately once per week during the 6-9 weeks of intervention. Examples of instructional strategies measured on the fidelity checklist included (a) the extent to which teachers adhered to the provided script and (b) frequency with which teachers provided children the correct feedback. Teachers' level of implementation was a

percentage of items checked "yes" by dividing the total number of possible items and then multiplying by 100. Thus, teachers' scores could range between 0 (lowest possible fidelity) to 100% fidelity.

Teachers' Behavior Management. To collect data on teachers' use of behavior management strategies, an observation checklist was developed that allowed the recording of the percentage of the teacher's pre-session, during-session, and responsive behavior management strategies relative to the *PA Path to Literacy.* Examples of pre-session strategies included: (a) teacher reviewed behavior expectations prior to intervention activities; (b) teacher used instruction that gave children direction on what to do rather than what not to do. Examples of during-session positive strategies included: (a) teacher reminded children of behavior expectations throughout the intervention; (b) teacher's tone was generally calm, supportive, and positive throughout the intervention; (c) teacher provided specific, descriptive praise to children; (d) teacher often addressed the children by name. Examples of responsive behavior management strategies included: (a) teacher assisted individual children who were exhibiting off-task behavior to become appropriately engaged, and (b) teacher provided descriptive praise to children when the child(ren) began on-task behavior. Results of measurement included: (a) the overall percentage with which teachers implemented all types of behavior management strategies (i.e., pre-session, during-session, responsive); and (b) the percentage with which teachers implemented each type of behavior management strategy (i.e., pre-session, within-session, responsive). Data were reported as percentages of each type of strategy implemented and percentages of total strategies implemented. This measure and scoring guide can be found in Appendix F.

Child responding. To answer questions regarding the level with which children responded to teachers' prompts during instruction, a researcher-created observation checklist was developed (i.e., *Child Responding Checklist)* whereby children's responses to literacy prompts were recorded as correct or incorrect. Nonresponse was scored as incorrect. Scores produced were a percentage of responses scored correct. This measure and scoring guide can be found in Appendix G.

Child engagement. To answer research questions regarding amount of time children spent on-task during *PA Path to Literacy*, a momentary time-sampling measure of children's on-task behavior was developed to record the percentage of intervals each child was observed actively engaged in intervention activities. A momentary time sampling method was used, given that each intervention session was a maximum of 15 min in length and behaviors were observed and measured every 10 s, momentary time sampling can potentially produce a result similar to that of continuous measurement (J. Powell, Martindale, & Kulp, 1975). A free interval loop timer application was downloaded to an iPad Mini in order to accurately record child engagement at the specified intervals. While watching video recorded intervention sessions, individual children were observed for 10 s intervals across the intervention activities for a maximum of 10 minutes. If a recorded session was longer than 10 minutes, the first 3 min on intervention were observed, the middle 4 min, and the last 3 min. At the moment the timer sounded, the behavior exhibited by the focus child was recorded as one of seven researcher-developed codes, which could later be categorized as either on-task or off-task behavior. On-task behavior codes included: (a) Academic Verbal Response or Gesture, (b) Academic Attention, and (c) Academic Talk. Off-task behavior codes included: (a) Competing Behavior, (b) Non-Participation, (c) Leaving the Area, and (d) Unavailable. Using this method, results were

presented as a percentage of intervals during a Tier 2 PA intervention in which children displayed on-task or off-task behavior. See Appendix D for a summary of measures used in the current study, and Appendix H for the *Child Engagement Observation* measure and scoring guide.

In order to answer questions relating to children's early literacy outcomes, two Dynamic Indicators of Basic Early Literacy Skills (DIBELS) measures were used to measure and monitor children's growth in early literacy skills: *First Sound Fluency* and *Word Parts Fluency*.

First Sound Fluency (FSF). FSF was a 60- point measure of alliteration used to assess a child's ability to produce the first sound of a word provided by the assessor. After stating standardized directions, the assessor presented the first word to the child, and started a timer set for 1 min. The raw score was calculated by recording the total number of correct answers provided by the child within 1 minute.

Word Parts Fluency (WPF). WPF was a 36-point measure used to assess a child's ability to isolate the first part of a word. After stating standardized directions, the assessor presented the first word to the child, and started a time set for 1 min. The raw score was calculated by recording the total number of correct answers provided by the child within 1 minute.

Two other measures, Letter Naming and Letter Sounds, were developed by CRTIEC staff for the purposes of the larger RCT and were used in the current dissertation study. For these measures, an assessor presented a letter printed on a card to a child and asked the child to name the letter and then asked what sound the letter made. One point for each correct answer was given. Eleven letters were presented, for a possibility of a score of 11 on Letter Naming and 11 on Letter Sounds.

Procedures

Procedures and analysis for the current study took place based on observations taken from four video recordings of each classroom intervention group across the 12 intervention units. See Appendix I for the schedule of video observations across the study. From the video observations, child on-task behavior and teachers' use of behavior management strategies were recorded using researcher-developed measures, as described previously. Video recording was chosen over live recording of behaviors because video recording provided the researcher with multiple opportunities to observe both child and teacher behavior in the same setting, as well as observe the behavior of up to three children in the same setting. Each video observation was approximately 10 to 15 minutes in length and captured the entire of intervention session for that day. Intervention sessions were videotaped approximately once every three weeks or approximately 4 times in each classroom. Each video was repeatedly viewed in order to record multiple variables of interest within one intervention session (i.e., teachers' behavior management, child responding, child on-task behavior). In three of the five classrooms, a second trained classroom staff member conducted intervention activities one time out of the four video recorded sessions. In the remaining two classrooms, only a single teacher conducted intervention activities.

Reliability. To estimate interobserver reliability, two trained observers (i.e., the researcher and another graduate student) independently scored a randomly selected 30% of all observations. Interobserver agreement (IOA) was calculated across observations for (a) teachers' fidelity of implementation, (b) teachers' use of behavior management strategies, (c) child responding, and (d) child on-task behavior. Reliability scores were calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by

100, resulting in a percentage of agreement. Results of reliability calculations are displayed in Table 1.

Table 1.

Mean and Range of Interobserver Agreement Across Measures

	Teacher Implementation Fidelity	Teacher Behavior Management Strategies	Child Correct Responding Checklist	Child On-Task Behavior Checklist
Mean	88.9%	92.5%	89%	95.0%
Range	86.7 - 91.2%	85.0 - 100.0%	86.3 - 93.6%	87.0 - 100.0%

Research Design and Analysis

The research questions addressed in this descriptive study were answered using a single case design analytic approach with observation measures repeated over time (Kennedy, 2005). The measures combined to answer questions exploring teachers' implementation fidelity of the *PA Path to Literacy* intervention, teachers' use of behavior management strategies, and how those factors relate to correct responding, children's on-task behavior, and early literacy outcomes. Therefore, in this study each "case" refers to classroom level variables, for a total of five classrooms, or cases. As characteristic of single case research, graphic display provided visual analysis of the trends, level, and variability of data at the classroom level. Teacher behaviors were graphed across four observations, and a denotation was made on each graph when a second classroom staff member implemented intervention activities. Descriptive statistics were used to analyze classroom-level and child-level research questions. First, descriptive statistics such as mean and range were calculated to answer research questions at the classroom level regarding teachers' fidelity to instructional strategies, use of behavior management strategies, and total mean levels of correct responding and on-task behavior within each classroom. Graphs were then developed to visually represent teacher behaviors during the

four observations in each classroom. For remaining research questions, children's behaviors were imposed on the graphs containing teacher-level data. This approach supported investigation of continuity and covariation, allowing questions regarding comparisons of teachers' implementation and use of behavior management strategies with children's behaviors and outcomes to be answered.

For each research question, the mean level (average) of child and teacher variables were computed and graphed. Second, the trend of the data was reviewed by examining whether child level scores indicated upward or downward trajectory within each classroom. Child-level data was also examined to determine if scores trended in the same direction as the teacher-level scores within classroom, thus examining covariation of child-level scores with teacher-level scores. Third, variability, or differences between high and low child-level scores within and across classrooms was analyzed and compared to levels, trends, and variability in classrooms-level data.

CHAPTER 4: Results

Research question 1. What is the mean and range of teachers' use of literacy and behavior management strategies within PA Path to Literacy, as indicated by the following:

a. *fidelity of implementation of instructional strategies during PA Path to Literacy, as measured by an implementation checklist,*
b. *percentage of behavior management strategies implemented, as measured by direct observation?*
c. *percentage of pre-session, during-session, and reactive behavior management strategies implemented, as measured by direct observation?*

Across classrooms, the means and ranges of teachers' fidelity of implementation of instructional strategies during the *PA Path to Literacy* intervention varies considerably, as does the total mean level of use of behavior management strategies. A variation is also seen in the types of behavior management strategies implemented by each classroom team.

Overall, the mean level of fidelity to instructional strategies during the *PA Path to Literacy* intervention was 74.2%, with a range of 37.5 – 94.4%. Of the five classrooms, the highest mean level of teachers' fidelity to instructional strategies was Classroom 2, with 83.3% (range = 77.8 – 93.1%). Classroom 3 exhibited the lowest mean level with 56.6% (range = 37.5 – 68.1%) (see Table 2).

Overall, the mean level of behavior management strategies implemented was 50.2%, with a range of 15.0 – 70.6%. The highest mean level of teachers' implementation of behavior management strategies was Classroom 4 (61.76%, range = 47.06 – 70.59%). The highest mean level of during-session strategies were provided in Classroom 4 (68.2%) (see Table 3), and no responsive behavior management strategies were provided in this classroom. Classroom 1

exhibited the lowest mean level of behavior strategies implemented (33.0%, range = 15.0 – 47.1%) (see Table 2). The lowest level of during-session strategies were provided in Classroom 1 (36.4%) (see Table 3), and 11.1% of responsive behavior management strategies (range = 0.0 – 33.3%) were provided.

Table 2.
Classroom Level Descriptive Statistics Rank Ordered According to Fidelity of Implementation of Literacy Strategies

		Literacy Strategies		Behavior Management		Correct Responding		On-Task Behavior	
Rank	Classroom	Mean	Range	Mean	Range	Mean	Range	Mean	Range
1	2	83.3%	77.8 - 93.1%	50.3%	35.3 - 60.0%	65.2%	57.4 - 72.5%	92.3%	87.0 - 97.0%
2	4	83.0%	76.4 - 94.4%	61.8%	47.1 - 70.6%	81.0%	73.7 - 84.4%	96.0%	94.0 - 98.0%
3	5	76.0%	72.2 - 81.9%	49.7%	40.0 - 64.7%	34.2%	30.2 - 40.0%	85.3%	76.0 - 94.0%
4	1	71.9%	63.9 - 81.9%	33.0%	15.0 - 47.1%	45.5%	12.8 - 70.2%	80.0%	58.0 - 99.0%
5	3	56.6%	37.5 - 68.1%	56.4%	47.1 - 64.7%	57.3%	41.1 - 65.3%	88.3%	82.0 - 98.0%

Table 3.
Use of Behavior Management Strategies and Classroom-Level Descriptive Statistics Rank Ordered by Total Use of Behavior Management Strategies

			Pre-Session		During-Session		Responsive		Correct Responding		On-Task Behavior	
Rank	Classroom	Total	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range
1	4	61.8%	50.0%	16.7 - 66.7%	68.2%	63.6 - 72.7%	N/A***	N/A**	81.0%	73.7 - 84.4%	96.0%	94.0 - 98.0%
2	3	56.4%	70.8%	66.7 - 83.3%	47.7%	27.3 - 63.6%	66.7%	N/A**	57.3%	41.1 - 65.3%	88.3%	82.0 - 98.0%
3	2	50.3%	66.7%	33.3 - 83.3%	40.9%	18.2 - 54.5%	66.7%	N/A**	65.2%	57.4 - 72.5%	92.3%	87.0 - 97.0%
4	5	49.7%	54.2%	33.3 - 66.7%	45.5%	18.2 - 72.7%	66.7%	N/A**	34.2%	30.2 - 40.0%	85.3%	76.0 - 94.0%
5	1	33.0%	33.3%	N/A*	36.4%	9.1 - 54.5%	11.1%	0.0 - 33.3%	45.5%	12.8 - 70.2%	80.0%	58.0 - 99.0%

Note: N/A = No range is specified due to no variance of scores. N/A** = Only one observation included responsive behavior strategies. N/A*** = No observation of responsive behavior management strategies across the observations.*

Research question 2. What is the mean percentage of children's level of correct responding and on-task behavior within and across classrooms?

Both within and across classrooms, there is significant variation in the mean and range of children's correct responses (See Table 2). Overall, the mean percentage of children's correct responding to instructional prompts provided by the teacher was 56.6%. Classroom 4 had the highest mean level of children's correct responding (81.0%). By child, in Classroom 4 the means were 83.6% (Child 2), 81.5% (Child 1) and 77.8% (Child 3) correct responses in corresponding rank order. Classroom 5 had the lowest mean level of children's correct responding (34.2%). By child, in Classroom 5 the means were 33.6% (Child 2) and 34.9% (Child 1) correct responses in corresponding rank order.

Overall, the mean percentage of children's on-task behavior during the PA intervention was 88.3%. Classroom 4 had the highest mean level of children's on-task behavior (96.0%) (see Table 2). By child, in Classroom 4 the means were 98% (Child 2), 96% (Child 3), and 94% (Child 1) on-task behavior in corresponding rank order. Classroom 1 had the lowest mean level of children's on-task behavior (79.5%). By child, in Classroom 1 the means were 70% (Child 1) and 89% (Child 2) on-task behavior in corresponding rank order.

Research question 3. Does children's frequency of correct responding within PA Path to Literacy covary with the following teachers' behaviors:

a. fidelity of implementation of instructional strategies during PA Path to Literacy

b. percentage of total behavior management strategies implemented

Across the five classrooms, there does not appear to be a consistent covariation of children's levels of correct responding with teachers' fidelity of instructional strategies during the *PA Path to Literacy* intervention. Classroom 4 had the highest mean level of children's correct responding (81.0%), and the second highest mean level of fidelity of implementation of instructional strategies (83.0%), though only slightly below the mean levels observed in Classroom 2 (83.3%) (see Table 2). Classroom 5 had the lowest mean level of children's correct responding (34.2%), and was third in rank order of fidelity to instructional strategies.

Overall, when looking at covariation between children's levels of correct responding and percentage of total behavior management strategies implemented, there appears to be a more consistent pattern. As mentioned previously, Classroom 4 had the highest mean level of children's correct responding (81.0%), and also shows the highest mean level of use of behavior management strategies (61.8%) (see Table 3). Classroom 5 had the lowest mean level of children's correct responding (34.2%) and was fourth out of five in rank order of use of behavior

management strategies. Notably, the three classrooms with the highest mean levels of children's correct responding (Classrooms 4, 2, 3 respectively) are also the three classrooms with the highest mean levels of use of behavior management strategies (Classrooms 4, 3, 2, respectively) (see Table 3).

Classroom 1 also showed considerable variability in rates of children's correct responding within the classroom, though the data trends in the same direction for both children on each observation (see Figure 2). When video recording for the third time in Classroom 1, a second teacher conducted the intervention session, and both children's levels of correct responding appear to significantly deviate from their previous levels of correct responses to literacy intervention prompts. Children in Classroom 2 (see Figure 3) show more stability in rates of correct responses across intervention sessions, and teacher fidelity behaviors increase after a slight decrease earlier in the intervention. Classroom 3 (see Figure 4) teacher fidelity behaviors vary, in that rather than trending in one direction, fidelity behaviors bounce upward and downward across the four observations. Children's levels of correct responding take on a somewhat similar pattern, with the exception of the third child, whose levels of correct responding decrease over time within the PA intervention. Classroom 5 (see Figure 6) demonstrated a stable level of fidelity to instructional strategies, but a varied level of fidelity of behavior management strategies. The two children in this classroom showed low levels and low variability of correct responding across the four observations.

Figure 2. Classroom 1 Covariation of Children's Correct Responding with Teacher Behaviors.

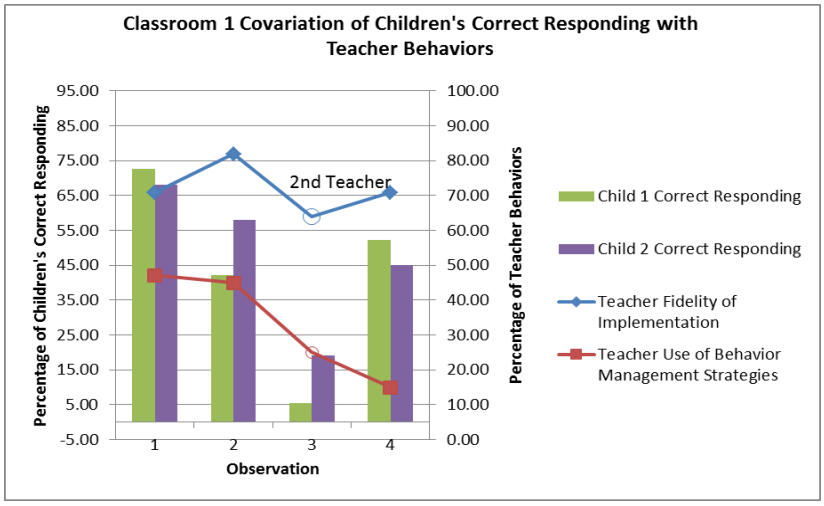


Figure 3. Classroom 2 Covariation of Children's Correct Responding with Teacher Behaviors.

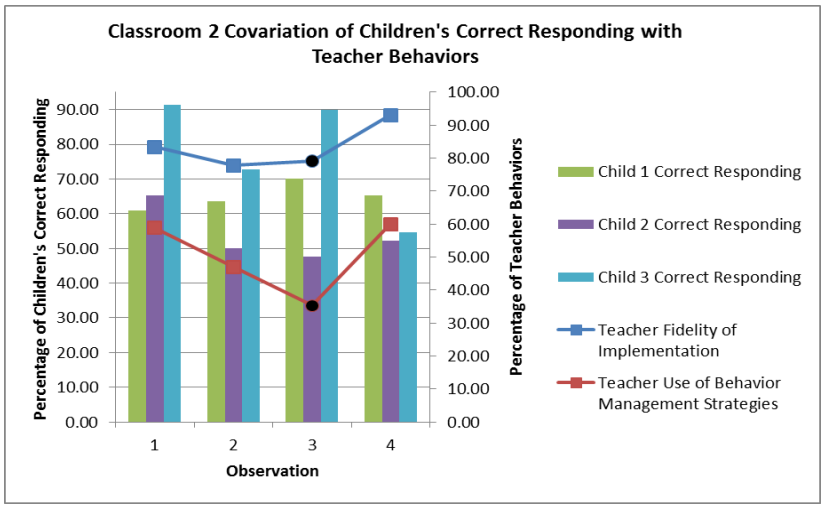


Figure 4. Classroom 3 Covariation of Children's Correct Responding with Teacher Behaviors.

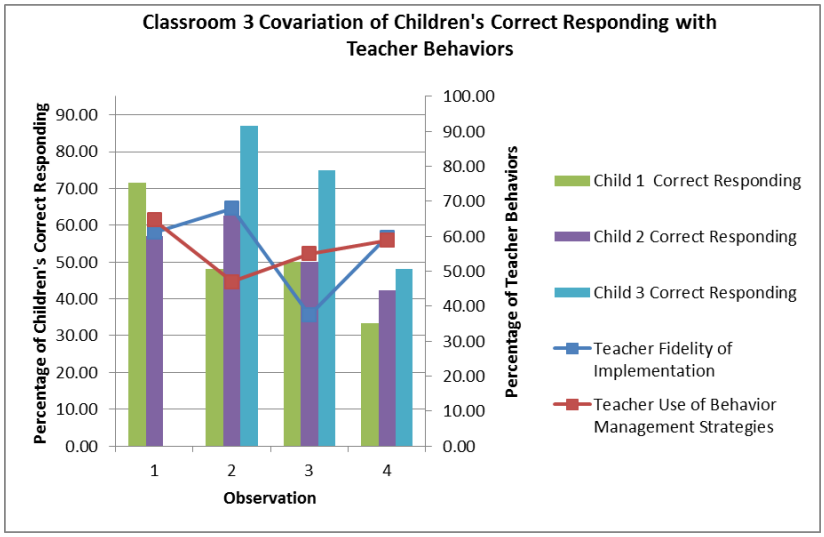


Figure 5. Classroom 4 Covariation of Children's Correct Responding with Teacher Beahviors.

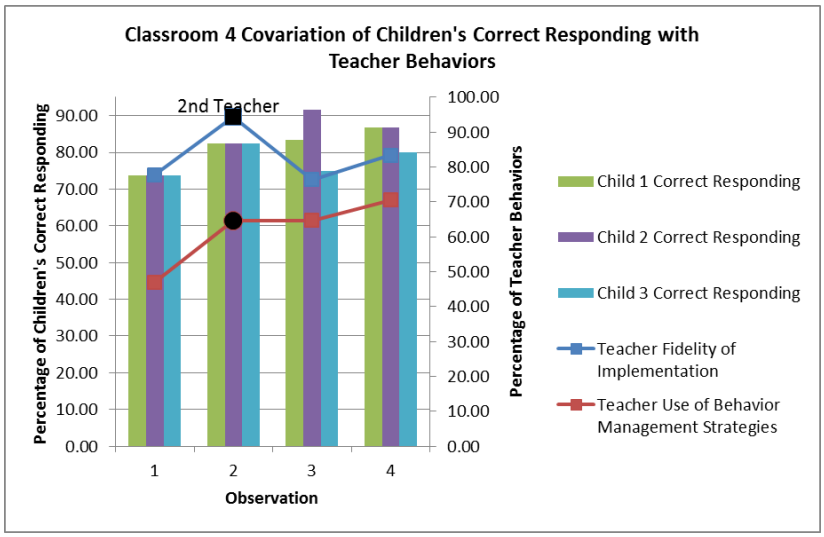
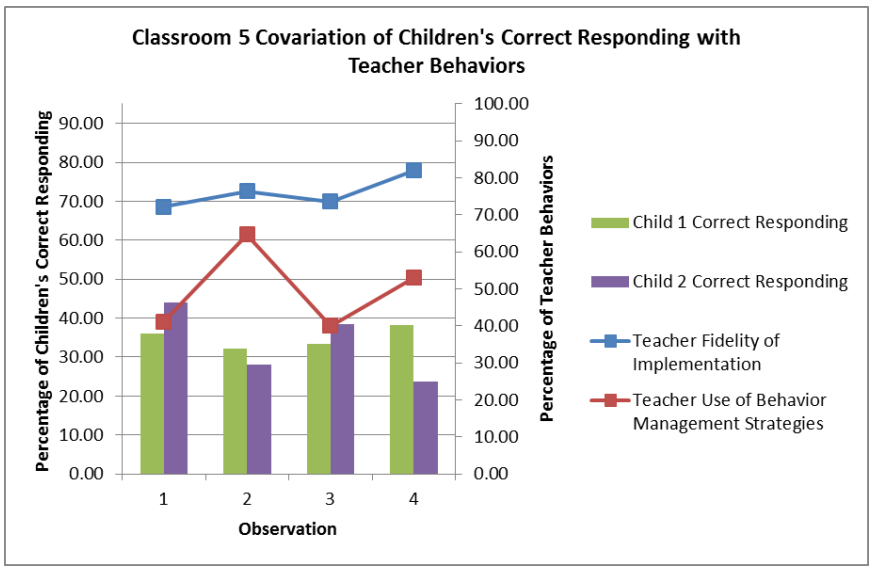


Figure 6. Classroom 5 Covariation of Children's Correct Responding with Teacher Behaviors.



Research question 4. Do children's rates of on-task behavior within the PA Path to Literacy intervention covary with the following teachers' behaviors:

a. fidelity of implementation of instructional strategies during PA Path to Literacy

b. percentage of behavior management strategies implemented

Overall, children's rates of on-task behavior are high, at rates of 73% or above, with the exception of two observations of Child 1 in Classroom 1 (See Figure 7). While rates of on-task behavior are generally high, teachers' fidelity of implementation of instructional strategies varies considerably across classrooms, indicating a lack of covariation between children's on-task behavior and teachers' fidelity of implementation of instructional strategies. Rates of implementation of behavior management strategies were quite variable from one classroom to another, and some variation existed within classroom as well.

Classroom 4 had the highest mean rates of children's on-task behavior (96.0%), the second highest (behind the first ranked by 0.3%) mean level of implementation fidelity, and the highest mean levels of use of behavior management strategies. By child (see Figure 10), the children's rates of on-task behavior were 98% (Child 2), 96% (Child 3), and 94% (Child 1) on-

task behavior, in corresponding rank order. In this classroom, children exhibited on-task behavior at a rate of 88% or higher across all children and observations, with all three children demonstrating on-task behavior 100% of the time during at least one observed intervention session.

Classroom 1 (see Tables 2 and 3) had the lowest mean rates of children's on-task behavior (80.0%), the second lowest mean level of implementation fidelity, and the lowest mean level of use of behavior management strategies. By child (see Figure 7), the children's rates of on-task behavior were 70% (Child 1) and 89% (Child 2), in corresponding rank order. In this classroom, children's rates of on-task behavior varied considerably between the two children. Child 1 demonstrated variable rates of on-task behavior between observations, with a range of 33% during Observation 3 and 100% during Observation 1. Child 2 exhibited more stable rates of on-task behavior, with a range of 80 – 97% between observations.

Further, when visually inspecting the trends in data across all classrooms, some children's rates of on-task behavior follow a similar direction as teachers' rates of behavior management strategies. That is, when teachers implemented a higher rate of behavior management strategies, children's rates of on-task behavior also increased. For some children, when teachers implemented a lower rate of behavior management strategies, children's rates of on-task behavior also decreased.

Figure 7. Classroom 1 Covariation of Teacher Behavior with Children's On-Task Behavior.

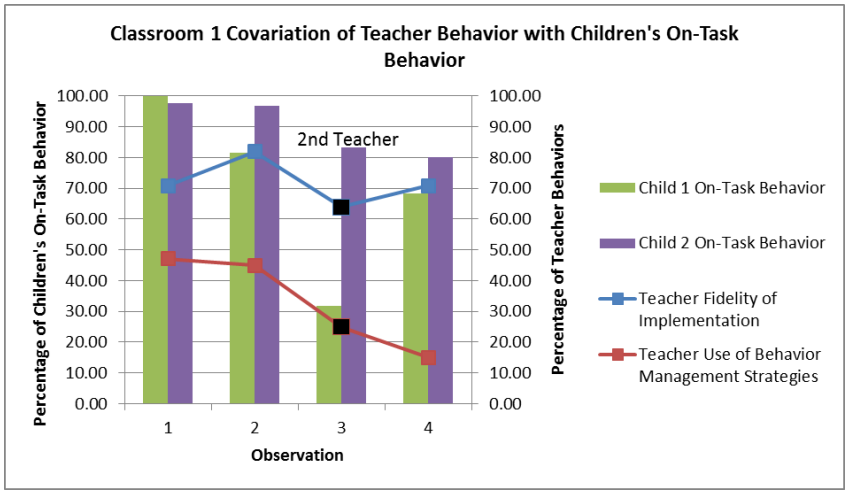


Figure 8. Classroom 2 Covariation of Teacher Behavior with Children's On-Task Behavior.

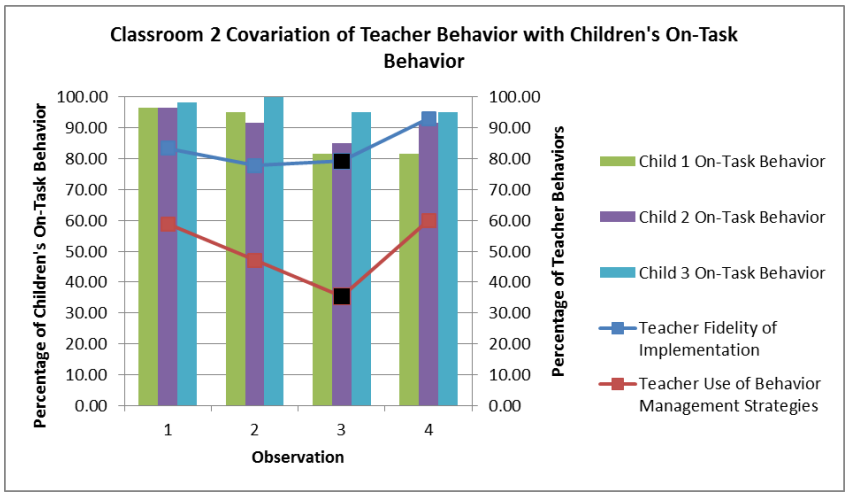


Figure 9. Classroom 3 Covariation of Teacher Behavior with Children's On-Task Behavior.

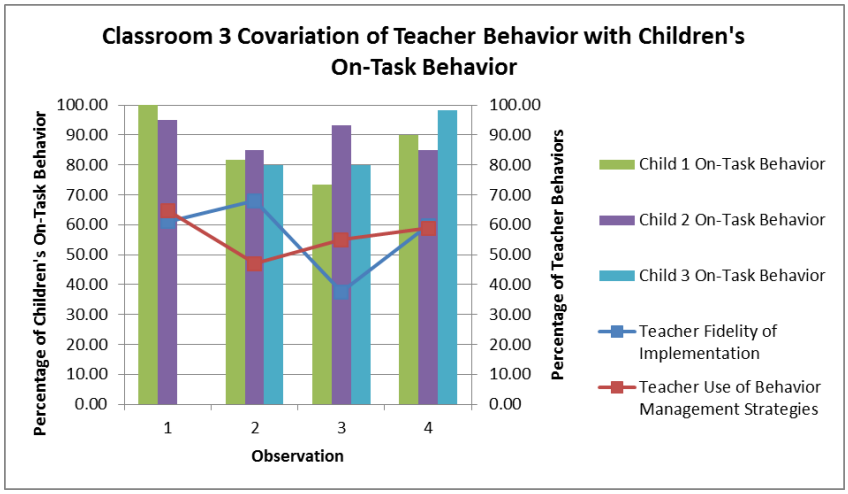


Figure 10. Classroom 4 Covariation of Teacher Behavior with Children's On-Task Behavior.

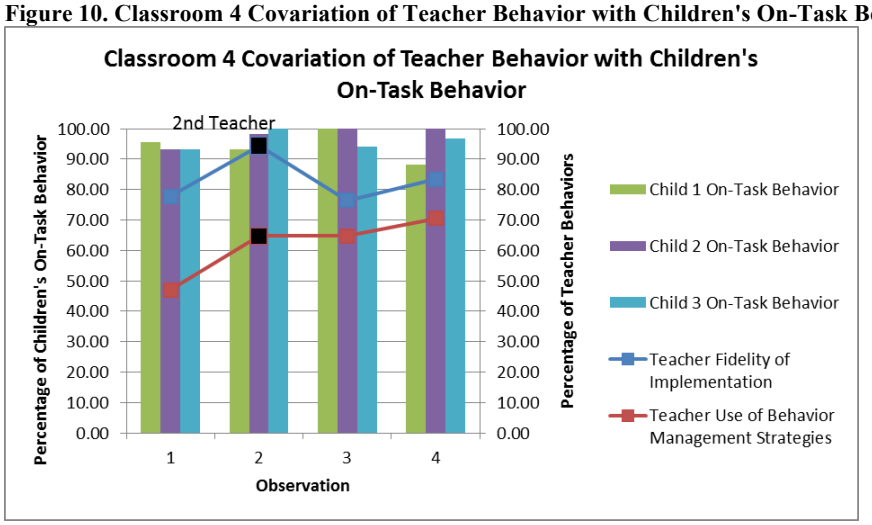
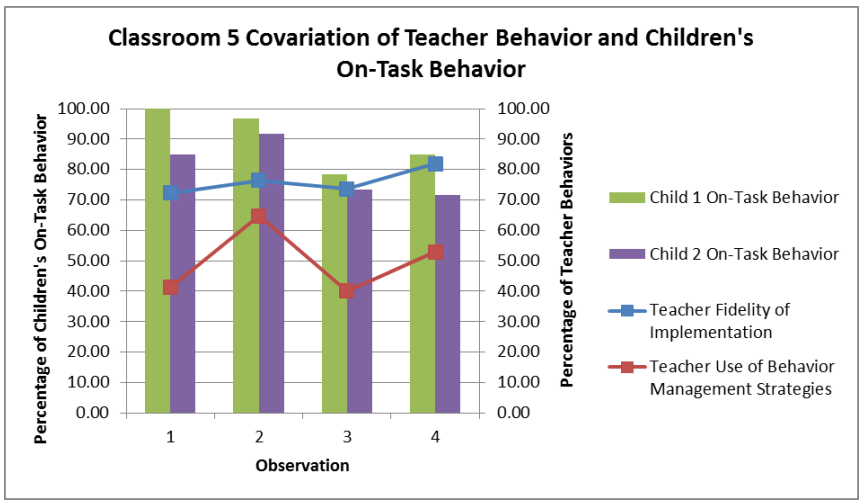


Figure 11. Classroom 5 Covariation of Teacher Behavior and Children's On-Task Behavior.



Research question 5. Does children's growth on early literacy outcomes, as measured by First Sound Fluency, Word Parts Fluency, Letter Naming, and Letter Sounds covary with the following teachers' behaviors:

a. *fidelity of implementation of PA Path to Literacy*

b. *percentage of behavior management strategies implemented*

Overall at the classroom level, children made greater gains from pre- to post-assessment on PA measures (FSF, WPF) than those of alphabet knowledge (LN, LS) (see Table 4). At the child level, not all children made gains on all measures, but all children made gains on at least one measure of early literacy (see Table 5). Classroom 4 had the highest total mean literacy gains (11.9) (see Table 4). By child, gains were 12 points (Children 1, 3) and 10.5 (Child 2) (see Table 4). Classroom 3 had the lowest total mean literacy gains (2.5) (See Table 4). By child, gains from pre- to post-assessment were -1.3 (Child 1), 2.0 (Child 3), and 6.8 (Child 2) (See Table 5).

Classroom 2 had the highest mean level of fidelity of instructional strategies (83.3%), and the fourth highest mean literacy gains (4.6). Classroom 3 had the lowest mean level of fidelity of

instructional strategies (56.6%), and the lowest total mean literacy gains (2.5). Classroom 4 had the highest mean level of use of behavior management strategies and the highest mean gains on literacy measures from pre- to post-assessment. Classroom 1 had the lowest mean levels of use of behavior management strategies (33.3%), and the second highest total mean literacy gains (5.4).

Table 4.

Teachers' Behaviors and Classroom-Level Mean Literacy Gains Rank Ordered By Total Mean Literacy Gains

Rank	Classroom	Mean Literacy Strategies	Mean Behavior	Total Mean Literacy Gains	Mean FSF Gains	Mean WPF Gains	Mean LN Gains	Mean LS Gains
1	4	83.0%	61.8%	11.9	24.7	11	5.7	6
2	1	71.9%	33.0%	5.4	3.0	12.5	3.0	3.0
3	5	76.0%	49.7%	5.1	5.0	5.0	6.0	4.5
4	2	83.3%	50.3%	4.6	5.3	3.7	3.3	6.0
5	3	56.6%	56.4%	2.5	7.3	1.0	0.3	1.3

Table 5.

Child-Level Literacy Gains from Pre- to Post- Intervention

	Child 1 Gains				Child 2 Gains				Child 3 Gains			
Classroom	FSF	WPF	LN	LS	FSF	WPF	LN	LS	FSF	WPF	LN	LS
1	6.0	12.0	2.0	1.0	0.0	13.0	4.0	5.0				
2	16.0	11.0	1.0	5.0	0.0	0.0	4.0	11.0	0.0	0.0	5.0	2.0
3	2.0	0.0	-6.0	-1.0	14.0	3.0	6.0	4.0	6.0	0.0	1.0	1.0
4	28.0	10.0	6.0	8.0	24.0	13.0	2.0	3.0	22.0	10.0	9.0	7.0
5	9.0	9.0	2.0	3.0	1.0	1.0	10.0	6.0				

Note. Blank cells indicate that there were only two child participants within the corresponding classroom.

CHAPTER 5: Discussion

The purpose of this investigation was to examine the influence of teachers' behaviors on children's participation and early literacy outcomes within a Tier 2 phonological awareness intervention. Previous studies have shown that implementation fidelity is a multi-dimensional construct, and that other factors (e.g., children's participation, teachers' relational factors) may influence early literacy outcomes more than does adherence to procedures (Hamre, et al., 2010) Further, research has linked children's behavior with emergent literacy outcomes, and children's engagement also influences literacy outcomes (Bulotsky-Shearer & Fantuzzo, 2011; Missall, et al., 2006). However, there is a dearth of research linking teachers' behavior management strategies and children's academic outcomes. There is a lack of understanding of what teachers are doing to promote children's engagement and how this influences children's outcomes. Measuring teachers' use of behavior management strategies during a Tier 2 PA intervention in this study provided a first look at what preschool teachers are doing within a PA intervention to promote at-risk children's correct responding and on-task behavior and how this in sum influences early literacy outcomes.

The theory of change underlying this study was that in classrooms where teachers demonstrate higher levels of fidelity to instructional strategies and higher use of behavior management strategies, children would exhibit higher levels of correct responding, on-task behavior, and have greater early literacy outcomes within a Tier 2 PA intervention. Overall, the results from this study begin to confirm this framework. While additional research is needed to form a direct link from teacher behaviors to child-level behaviors and outcomes, patterns did emerge that move toward confirming this hypothesis.

In summary, teachers' behaviors (i.e., fidelity of instructional strategies, use of behavior management strategies) varied considerably across the five classrooms in this study. Even when provided a scripted PA intervention and a classroom coach to observe and provide feedback on a weekly basis, some teachers' adherence to instructional procedures still varied across observations. Four of the five teachers kept their mean levels of implementation of instructional strategies in a range of 71 – 83%, but one teacher's mean level was much lower, at 53%. Through use of single subject design procedures, visual inspection of the data reveals that children's mean levels of correct responding, on-task behavior, and early literacy outcomes do not appear to be directly influenced by teachers' fidelity to instructional procedures alone. Even in the classroom where children received instruction from a teacher providing the lowest mean level of fidelity to instructional strategies, children's mean rates of on-task behavior and correct responding were still greater than classrooms whose teachers demonstrated higher mean rates of fidelity of implementation.

Further, when looking across the five classrooms at individual observations of implementation fidelity, children's mean levels of correct responding did not covary with teachers' mean levels of implementation fidelity. That is, on days when the teacher had a higher measure of implementation fidelity, a covarying higher measure of correct responding was not observed. However, it is possible that a threshold of fidelity is related to children's participation rather than a covariation. For example, in the two classrooms (2, 4) where implementation fidelity was the highest at above 80%, the highest levels of children's correct responding and on-task behavior were also seen. The highest literacy outcomes were also observed in Classroom 4, but the literacy outcomes in Classroom 2 were among the lowest of the five classrooms. These results further corroborate results from previous studies that indicate other factors outside of

adherence to procedures may more strongly influence children's participation and outcomes. However, because rates of implementation fidelity were variable with averages not reaching above 83%, additional research should investigate how greater fidelity influences various child outcomes, or if specific instructional strategies are of greater influence than others. Further investigation into a threshold level of fidelity is also warranted.

Interestingly, in this study children's mean levels of correct responding varied across classrooms, but remained relatively stable within classrooms. This could be a function of the evidence-based strategies utilized within the *PA Path to Literacy* intervention, such as the provision of corrective feedback to children and multiple opportunities to respond to instructional prompts. Tier 2 instruction is characterized as instruction with greater intensity than what is provided within the general curriculum alone and the *PA Path to Literacy* intervention was designed for teachers to evoke and reinforce correct responses from children.

An important finding emerged in this study from the examination of teachers' use of behavior management strategies. Results from this investigation show that in the classroom where the teacher provided the greatest levels of behavior management strategies, children demonstrated the highest mean levels of correct responding. In the two classrooms where the teachers provided the lowest levels of behavior management strategies, children also exhibited the lowest mean levels of correct responding. This indicates that a teachers' use of behavior management strategies could be an important influence on children's active engagement in a Tier 2 PA intervention.

Rather than considering covariance of teachers' behaviors with children's participation and early literacy outcomes, again it is possible that a threshold of teachers' fidelity and use of behavior management strategies is necessary in order to influence children's participation and

outcomes. When analyzing individual observations of teachers' use of behavior management strategies and children's correct responding, only in two out of the five classrooms were children's highest mean levels of correct responding observed on days when teachers' use of behavior management was also greatest. However, the teachers who had the top three levels of total behavior management strategies also had the top three levels of children's correct responding and on-task behavior, but not classroom-level literacy gains. Additional research is needed to further understand the influence of teachers' use of behavior management strategies on children's participation and outcomes in a Tier 2 PA intervention. Specifically, further investigation into the specific types of behavior management strategies utilized to promote children's correct responding is needed.

In the current study, it did not appear that pre-session behavior management strategies, such as providing behavior expectations, covaried with classroom-level variables. Those teachers that provided higher levels of during-session strategies, such as descriptive feedback or providing eye-contact, also had higher total levels of behavior management strategies. This could be simply because there were more items in the during-session strategies portion of the observation as compared to the other sections, but additional research is needed to determine if those strategies implemented during intervention activities have greater influence on child participation than other types of behavior management strategies. Further, understanding the dosage of behavior management strategies needed to elicit children's correct responding and how that influences children's early literacy outcomes would be beneficial.

Overall, mean levels of children's on-task behavior were high across the five classrooms in this study. This could be in part because requirements for inclusion in the research study were that children had the language and ability to participate. Children with significant behavior

concerns were excluded from the larger CRTIEC study in order to investigate the efficacy of the PA intervention effectively, and instruction on behavior management techniques were not a part of the investigation.

In the current study, the children who received instruction from the teacher who provided the greatest amount of behavior management strategies also demonstrated the highest mean levels of on-task behavior. Further, children who received instruction from the teacher who utilized the lowest amount of behavior management strategies demonstrated the lowest mean levels of on-task behavior. The results of this study begin to provide understanding of the influence of preschool teachers' use of behavior management strategies on at-risk children's on-task behavior during Tier 2 PA instruction. Because previous research has documented the importance of on-task behavior to the development of early literacy skills, clear documentation of how to promote children's on-task behavior is critical, and this study begins to fill this gap in the existing literature. Additional studies should be carried out to more closely examine how teachers' use of behavior management strategies influences children's on-task behavior during intervention activities. Experimental studies should take place in order to manipulate key variables to more directly determine the influence of teacher behavior on children's participation.

Finally, the results from the current investigation also begin to close the gap in the existing literature by examining the influence of teacher fidelity behaviors on children's early literacy outcomes. In this study, the children who received instruction from the teacher who provided the highest mean level of behavior management strategies demonstrated the greatest gains on two (i.e., FSF, LS) of the four measures of early literacy outcomes, and only demonstrated slightly lower gains on the other two measures (WPF, LN) as compared to children who made the greatest gains on those two measures. Further, all children in Classroom 4

demonstrated gains from pre- to post- assessment on all of the measures, with children exhibiting gains of 10 points or greater on measures of phonological awareness (FSF, WPF). Noteably, all three children made gains of 22 points or greater on FSF. However, even when receiving instruction from the teacher who provided the lowest mean level of behavior management strategies, children still made greater mean gains on WPF from pre- to post- assessment, though only small gains or no gains were seen on the other three measures. Results from the current study indicate that teachers' use of behavior management strategies may influence children's early literacy outcomes, and further investigation is critical to understand how outcomes are influenced and to identify the strategies that have the greatest influence on children's outcomes.

Limitations

First, the research design was limited to a descriptive design due to the experimental nature of the larger study from which participants were drawn. As such, no variables could be manipulated, so it is critical to conduct further research in which independent variables are identified and manipulated to provide greater understanding of which factors (e.g., teachers' behavior management strategies) have a greater influence on children's early literacy outcomes.

Second, in order to reduce burden on classroom teachers and the researcher, only four observations across approximately 10 – 12 weeks of intervention were recorded. Further, due to time and resources available, the research study took place in two preschool buildings within the same district. In order to more fully capture what takes place within a Tier 2 PA intervention, observations of all intervention sessions would be beneficial. Research in additional districts and preschool programs is imperative in order to strengthen the generalizability of findings.

Third, in some classrooms intervention sessions were conducted by two teachers. This was not a variable controlled by researchers and therefore it is unclear how this contributed to

children's participation and outcomes. Further investigation is needed to understand how individual teachers and their fidelity behaviors contribute to children's participation and outcomes during a Tier 2 PA intervention.

Implications for Practice

Given the national focus on school readiness and literacy outcomes, this study has important implications for practitioners and those educating pre-service teachers. First, classroom teachers should strongly consider integrating evidence-based behavior management strategies into early literacy instruction in order to increase children's on-task behavior and correct responding during Tier 2 PA interventions. Use of simple behavior management strategies when implementing an early literacy intervention may promote at-risk preschool children's active engagement and learning, necessary for increasing the potential for greater academic outcomes and later school successes. This study documents that teachers' use of behavior management strategies appear to influence preschool children's participation and outcomes, in addition to adherence to scripted procedures during PA instruction.

Second, it is critical that those in higher education provide pre-service teachers with the knowledge and skills necessary to locate and implement evidence-based behavior management strategies. Preschool teachers have reported their biggest concern is how to address problem behaviors (Joseph & Strain, 2003), and this study is one of the first to link teachers' behaviors with child behavior and early literacy outcomes. Therefore, this study highlights the imperative nature of providing teachers with the skill to implement behavior management strategies effectively in order to positively influence children's on-task behavior and early literacy outcomes.

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Appendix A: PA Path to Literacy Scope and Sequence

Scope and Sequence

The scope and sequence for the *PA Path to Literacy* intervention is shown below. There are 12 units of lessons, with 3 lessons in each unit (e.g., 1A, 1B, and 1C) for a total of 36 lessons (see Table 1).

Table 1. *PA Path to Literacy* Scope and Sequence.

Unit	Skill(s) taught	Instructional language example
1	Blending compound words, blending 2-syllable words	Let's say the parts of the word elbow: el (1) bow. Now you say the word.
2	Blending compound words, blending 2-syllable words, segmenting compound words	Listen to me say a word: rainbow. (Put hands together as if you just clapped.) Now listen to me say the parts of the word: rain (1) bow. (Stretch out a hand one at a time.) Say the word rainbow with me: rainbow. (Put hands together as if you just clapped.) Now let's say the parts of the word: rain (1) bow.
3	Blending 2-syllable words, segmenting compound words, segmenting 2-syllable words	Listen: bubble. Now you say the parts of the word.
4	Segmenting 2-syllable words	Now look at the marble. Let's say the word marble and jump. The word: marble! (Jump.) Now let's say the parts of the word and stomp: mar (1) ble. (Stomp.)
5	Concept of first, identification of first part of 2-syllable words	Watch my fingers and listen to the parts of the word: side (1) walk. (Hold up one finger then a second finger.) Say the parts of the word sidewalk with me and hold up your fingers: Side (1) walk. (Hold up one finger then a second finger.) Now, you say the first part of the word and hold up one finger. (2)
6		
7	Concept of sound, identification of little parts of compound and 2-sylllable words, identification of first sound in 1-syllable words	The word sunflower has two big parts: sun and flower. (Pull strips apart.) Words also have little parts. Like the word sun. (Put flower strip aside.) The little parts of the word sun are /s/ /un/. (Pull apart word strip cut into the two parts and when put together there is a complete picture of a sun.) The word: sun (Put word strips together.) The little parts of the word: /s/ /un/.
8	Identification of first sounds (simple) in 1-syllable segmented words	Listen: /m/. Now you point to the one that starts with /m/. Listen: /m/ /ud/. What's the first sound /m/ /ud/?
9	Identification of first sounds (complex) in 1- and 2-syllable segmented words	Listen: /tr/. Now you point to the one that starts with /tr/. Listen: /tr/ /ain/. What's the first sound /tr/ /ain/?
10	Identification of first sounds in whole words	Look at these pictures and words: cat, hat, bat. These words sound the same but they have different first sounds. Listen: cat, hat, bat (emphasize first sound). I need you to help me figure out the first sounds.
11		Some words have the same first sound. The words bat, bike, and ball all start with /b/. The first sound you hear in bat, bike, and ball is /b/. What's the first sound you hear in bat? (2) Is it /b/ or /m/?
12		This time, let's see how fast you can tell me your answers. I'm going to say some words. You tell me the first sound you hear in the words. Ready? Sled.

Appendix B: Informed Consent Letters (English Version)

Juniper Gardens Children's Project
University of Kansas
Parent Consent Form

Dear Parent:

During this school year, your child's classroom will participate in a study of *early literacy* skills that are important for learning to read. The goal of our project is to learn the best ways to teach early literacy skills in preschool so that children start kindergarten ready to learn to read. We are asking your permission for your child to be part of this study.

What does this study involve?

Assessment: If you give consent, please answer the short questionnaire about your family, attached to this form. This questionnaire will take about 5 minutes to complete. We also will ask the teacher about your child's home language, services for special needs, early literacy skills, and participation in the classroom. This fall, we will give your child a 15-minute test of language and literacy skills, such as naming pictures and words that rhyme. The purpose of this test is to identify children who might benefit from additional learning activities to build the pre-reading skills they will need in kindergarten. If the 15-minute test indicates your child might benefit from additional learning opportunities, we will give other assessments later in the fall to learn more about your child's language and literacy skills. These tests will take 15-50 minutes total and will be spread across different days.

Learning Activities: Following these assessments, we may ask your child to participate in <u>one</u> of the learning activities described below. Because we can only include a few children in each classroom, we will use the assessments to decide which children would benefit most from the activities and which type of activity would work best for each child. If tests indicate that several children in the classroom would benefit, we may select the final group randomly, such as by tossing a coin. We will work with teachers to make sure these activities contribute to what children are already learning and do not keep them from other important activities in the classroom. Also, whenever we test children, we will spread the assessments across different days so that children have time for other classroom activities and do not become too tired. All assessments will be given by our staff, who are experienced working with young children.

- **<u>Storybook Listening Centers</u>** – During Storybook Listening Centers, a small group of children will listen to stories on headphones and will follow along with picture books especially designed to teach vocabulary. One member of the classroom teaching staff will sit with children and help them use the center. The Listening Centers will take place 3-4 days a week in the classroom (15 minutes per day) and will continue for up to 12 weeks. Just before the listening centers begin, we will give children pre-tests of early literacy (60-75 minutes total). To measure children's progress, we will repeat some of the early literacy tests midway through the program (25-35 minutes total) and near the end of the school year (100-135 minutes total).

- **<u>Literacy Learning Centers</u> –** In the Literacy Learning Centers, a small group of children will participate together in educational activities that teach alphabet knowledge and sounds in words. Lessons will be conducted by a member of the classroom teaching staff and will include simple games and opportunities for children to participate and respond. These activities will take about 15 minutes per day, 3-4 days per week, for up to 12 weeks. Just before the learning centers begin, we will give children pre-tests of early literacy (60-75 minutes total). To measure

children's progress, we will repeat some of the early literacy tests midway through the program (25-35 minutes total) and near the end of the school year (100-135 minutes total).

We will make audio recordings of some assessments and learning activities. The audio will help us learn more about children's responses during interventions and assessments. These recordings will only be heard by people who are working on this project and will not include children's names. Audio recordings will be stored in a secure location and will be erased after 10 years.

Are there any risks in this research? We don't believe this study will involve any risks for you or your child. If you have any concerns, you may contact us at any time (see phone numbers at the end of this form). Also, if you would like to withdraw your consent at any time, you have the right to do that.

Is there any payment for participation? There will not be any payment for this study.

What are the benefits of being in this study? We believe the learning activities in this project will be helpful for children who may need additional instruction to be ready for learning to read in kindergarten. We also will use information from this study to develop strategies to improve preschool education in our community, as well as in other communities.

What information will we ask for? As described above, information will include assessments of children's language and early literacy skills and teachers' reports of home language and services for special needs. Children's scores on the assessments will be given to classroom teachers to help them plan learning activities and to help them monitor children's progress.

How will we protect your privacy? Everything we learn from you and your child is strictly confidential. Assessments and audio/video recordings will be identified by ID numbers, will not include your child's name, and will be stored in locked cabinets. We will not share any information that identifies you or your child with anyone outside our research staff and classroom teachers (as described above), with one exception. Our study data may be reviewed by officials at the University of Kansas who make sure that research is done in an ethical and legal way, and that participants are treated fairly. When we report the results of this study, you and your child will never be named or identified in any way. By signing this consent form, you give us permission to use and share this information, within the limits described above, at any time in the future.

If you give consent now, can you change your mind later? Yes. You are always free to withdraw your consent, without any type of penalty.

We will be glad to answer any questions you might have now or at any time during the study – even after the study is finished. So, please feel free to call us at 913-321-3143. If you have additional questions about your rights as a research participant or feel you have suffered an injury as a result of your participation in this research, you may contact the coordinator of the University of Kansas Human Subjects Committee, Lawrence – phone: 785-864-7429, **email: irb@ku.edu**.

We hope you will decide to be part of our project, and that it will be a good experience for you and your child. If you would like your child to participate, please sign below and keep one copy for yourself. Thanks very much for your time and assistance.

Sincerely,

Gabriela Guerrero (Coordinator) * 913-321-3143
Judith Carta (Project Director) Juniper Gardens Children's Project
Jane Atwater (Co-Director) University of Kansas
444 Minnesota Ave., Suite 300, Kansas City, KS 66101

* Contact in English or Spanish

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I have read the information in this form (or, it has been read to me), and I have had a chance to ask questions. I have received answers to any questions I had about information that will be used and shared in this study. I know that the information about me and my child will be kept private. I give permission for information about my child to be included in this study, knowing that I can withdraw my consent if I decide to. I agree to audio recording of assessments of my child. I also agree to the use and sharing of my information as described above. By signing this, I verify that I am at least 18 years of age and have received a copy of this consent form to keep.

_____ _____
Name of Child (Please print clearly) Child's Birth Date

_____ _____
Parent's Signature Date Signed

Additional Video Permission (Optional)

We would like to make videos of some Listening Centers and Literacy Learning Centers for research and educational purposes. Our research team would use the videos to see how children and teachers participated in the learning activities. For educational purposes, we would use the videos at workshops and meetings to show other teachers, researchers, and parents what the activities are like. If you give permission, your child might appear on one of the videos, but we would not identify your child by name and would not give any other information about your child personally. If you do not check "YES" below, we will not use any videos that include your child.

This additional video permission is completely voluntary, and you may change your mind at any time. Your child can still participate in the assessments and learning activities, even if you do not give this additional video permission. There is no compensation for being part of the videos. Thank you for considering this request.

If you agree, please check YES below and sign your name:

_____ YES, I give permission for videos of my child to be shown for research and educational purposes, as described above.

Parent Signature: _____

Juniper Gardens Children's Project

University of Kansas
Teacher Consent Form

Dear Teacher:

This study is part of a program of research conducted by the Center for Response to Intervention in Early Childhood (CRTIEC) at the University of Kansas. CRTIEC was funded to develop assessment and intervention strategies to promote the early literacy development of preschool children who are at risk for later reading difficulties. Our goal in this study is to test the feasibility and effectiveness of interventions that focus on early literacy skills that are fundamental for learning to read: **Tier 2 Intervention** for children who have some basic skills but may need additional support to be ready for kindergarten, and **Tier 3 Intervention** for children who have more significant delays. This year, we will focus on three intervention programs that have proven to be effective in our previous work.

We are requesting your consent to participate in one of two Tier 2 Interventions: (a) the ***Storybook Listening Center Program*** to build vocabulary and comprehension, or (b**)** the ***Literacy Learning Center Program*** to build core skills in phonological awareness and alphabet knowledge. The intervention for your class would be selected randomly.

What does this study involve?

If you consent, we will ask you for the following information: (a) a short survey about your education and experience in early childhood and about your classroom's curriculum and strategies for promoting early literacy; (b) information about home language and IEP status for children who have parent consent; (c) for some children, your opinions about their early literacy skills and participation in the classroom; and (d) a short questionnaire about your opinions of the intervention. Altogether these questions should take 15-20 minutes. At the end of the school year, you may also be offered an opportunity to volunteer to participate in an interview, which may be audio or videotaped, in order to share your experience while participating in this project.

Child Assessments:

Child assessments will be used to select children for the interventions and to measure children's progress and outcomes in early literacy. All will be conducted by CRTIEC staff who have experience working with young children. We will consult with you to identify the assessment times and locations that work best for your classroom, and we will spread assessments across different days, as needed, so that children have time for other classroom activities and do not become too tired.

- **Screening**: Early in the fall, we will give brief tests of language and early literacy skills to children who will be eligible for kindergarten next year and who have parent consent for this project (15 minutes per child). The primary purpose of this first screening is to identify children who might be good candidates for the interventions. Later, we will conduct additional screening and standardized assessments with those children whose first screening scores fall below 4-year-old benchmarks. These assessments would be spread across the fall semester and would total 15-50 minutes per child. Together, these assessments will help us identify a final group of children who seem most likely to benefit from the intervention.

- **Tier 2 Assessments**: Three children will be selected in classrooms that participate in either of the Tier 2 interventions (*Storybook Listening Centers* or *Literacy Learning Centers*). Just before the intervention begins, we will give these three children pre-tests of early literacy (60-75 minutes per child). To measure children's progress, we will repeat some of the early literacy tests midway through the program (25-35 minutes per child) and near the end of the school year (100-135 minutes per child).

Tier 2 Interventions:

Tier 2 interventions are small group activities conducted by classroom teaching staff as part of their regular classroom schedules, with close support from our research team. Classrooms that participate in Tier 2 will be randomly selected to implement one of the following:

- **Storybook Listening Centers:** During Storybook Listening Centers, the 3 selected children will listen to recorded stories on headphones and will follow along with matching picture books that are designed to teach new vocabulary and to build comprehension. To encourage children's active engagement, the books include embedded lessons where the recorded story stops occasionally for children to answer questions about the story or to manipulate items in the book (such as lifting a flap to reveal an answer). A member of the teaching staff would sit with the children, operate audio equipment, and help children stay engaged. The Listening Centers will take place 3-4 days a week in the classroom (15 minutes per day) and will continue for up to 12 weeks.

- **Literacy Learning Centers**: In the Literacy Learning Centers, the 3 selected children will participate together in educational activities that teach alphabet knowledge and sounds in words. Lessons will be conducted by a member of the classroom teaching staff and will include simple games and opportunities for children to participate and respond. Conducting the center involves presenting information, modeling early literacy skills, and checking children's learning of the focus skills. Centers would take about 15 minutes per day, 3-4 days per week, for 8-12 weeks.

What does implementation of the Tier 2 Intervention involve for the teaching team?

- Allow us to conduct assessments to identify 3 children to participate in the intervention and to follow the progress of intervention children.
- Meet with our staff to learn about the intervention and to practice with the materials. We anticipate that this may include a group meeting and an individual meeting with just your team, with a total time of 2-3 hours. However, we will work with you to schedule meetings that accommodate your schedule and the time you have available.
- Arrange to have member(s) of your teaching team conduct one of the Tier 2 intervention programs, to be chosen randomly: either the Storybook Listening Center program or the Literacy Learning Center program. This will be either in your AM or PM class.
- Conduct the intervention with the 3 selected children 3-4 days per week, 15 minutes per day, until the lessons are completed (up to 12 weeks).
- Allow a coordinator from our staff to visit your classroom, observe the intervention activities, and provide support. Visits will be weekly at first but may be less frequent as time goes by.
- Allow us to make occasional audio or video recordings of the listening or learning center (2-4 times across weeks of intervention). Our research team will use these videos to look more closely at children's participation in the intervention. Unless you give additional video permission for educational purpose (at the end of this form), any videos will only be seen by

CRTIEC staff for research purposes and will be erased after 10 years. Also, video recordings will only include children whose parents have signed a video permission form.

What support will the CRTIEC research team provide?

- We will provide all materials, equipment, and books needed for the intervention.
- To help you get started, we will provide information and support as described above.
- We will assign a coordinator from our staff to provide communication and ongoing support. Our staff will always be available to answer questions or address any concerns you may have.
- We will conduct all child assessments needed for the project and will provide you with an assessment report for children in your classroom.

Are there any risks in this research? We don't believe this study will involve any risks for you or the children. If you have any concerns, you may contact us at any time (see phone numbers at the end of this form). Also, if you would like to withdraw your consent at any time, you have the right to do that.

Is there any payment for participation? We will provide compensation of $25 to each teacher who participates in the training meetings. Also, we will compensate classrooms in the Tier 2 program for time required to complete surveys, communicate with the research team, implement the intervention, and accommodate our work in the classroom. The total is $280 per classroom. If a teaching team decides to leave the study early, compensation may be prorated based on months in the study. We may ask for your social security number in order to comply with federal and state tax and accounting regulations.

What are the benefits of being in this study? We believe the learning activities in this project will be helpful for children who may need additional instruction to be ready for learning to read in kindergarten. We will provide you with reports of assessment scores for children in your classroom. We also will use information from this study to develop strategies to improve preschool education in our community, as well as in other communities.

What information will we ask for? As described above, information will include assessments of children's early literacy skills, observations of listening centers, and teacher interviews and surveys.

How will we protect your privacy? Everything we learn from you and the children is strictly confidential. Assessments and audio/video recordings will be identified by ID numbers and will not include names of children or teachers. We will not share any information that identifies you with anyone outside our research staff, with one exception. Our study data may be reviewed by officials at the University of Kansas who make sure that research is done in an ethical and legal way, and that participants are treated fairly. When we report the results of this study, you will never be named or identified in any way. By signing this consent form, you give us permission to use and share this information, within the limits described above, at any time in the future.

If you give consent now, can you change your mind later? Yes. You are always free to withdraw your consent, without penalty.

We will be glad to answer any questions you might have now or at any time during the study – even after the study is finished. So, please feel free to call us at 913-321-3143. If you have additional questions about your rights as a research participant or feel you have suffered an injury as a result of your participation in this research, you may contact the University of Kansas Human Subjects Committee, Lawrence – phone: 785-864-7429, **email: irb@ku.edu.**

If you agree to participate, please sign below and keep one copy for yourself. Thanks very much for your time and assistance.

Sincerely,

Gabriela Guerrero (Project Coordinator) 913-321-3143
Judith Carta (Project Director) Juniper Gardens Children's Project
Jane Atwater (Co-Director) University of Kansas
444 Minnesota Ave., Suite 300, Kansas City, KS 66101

==========

I have read the information in this form and have had a chance to ask questions. I have received answers to any questions I had about information that will be used and shared in this study. I know that the information about me and children in my classroom will be kept private. I agree to participate in this study, knowing that I can withdraw my consent if I decide to. I also agree to the use and sharing of my information as described above. By signing this, I verify that I am at least 18 years of age and have received a copy of this consent form to keep.

_____ _____
Your Name (Please print clearly) School Name

_____ _____
Signature Date Signed

Additional Video Permission for Educational Purposes (Optional)

We would like to use some videos of Tier 2 interventions for educational purposes. We would use the videos at workshops and meetings to show other teachers, researchers, and parents what the activities are like. We would never identify you or the children by name. The videos will only include children whose parents have signed video permission for their child. If you do not check "YES" below, we will not use any videos from your classroom for educational purposes.

This additional permission is completely voluntary, and you may change your mind at any time. If you decide not to give permission for educational purposes, it will not in any way affect or limit your participation in the intervention study. There is no compensation for being part of the videos.

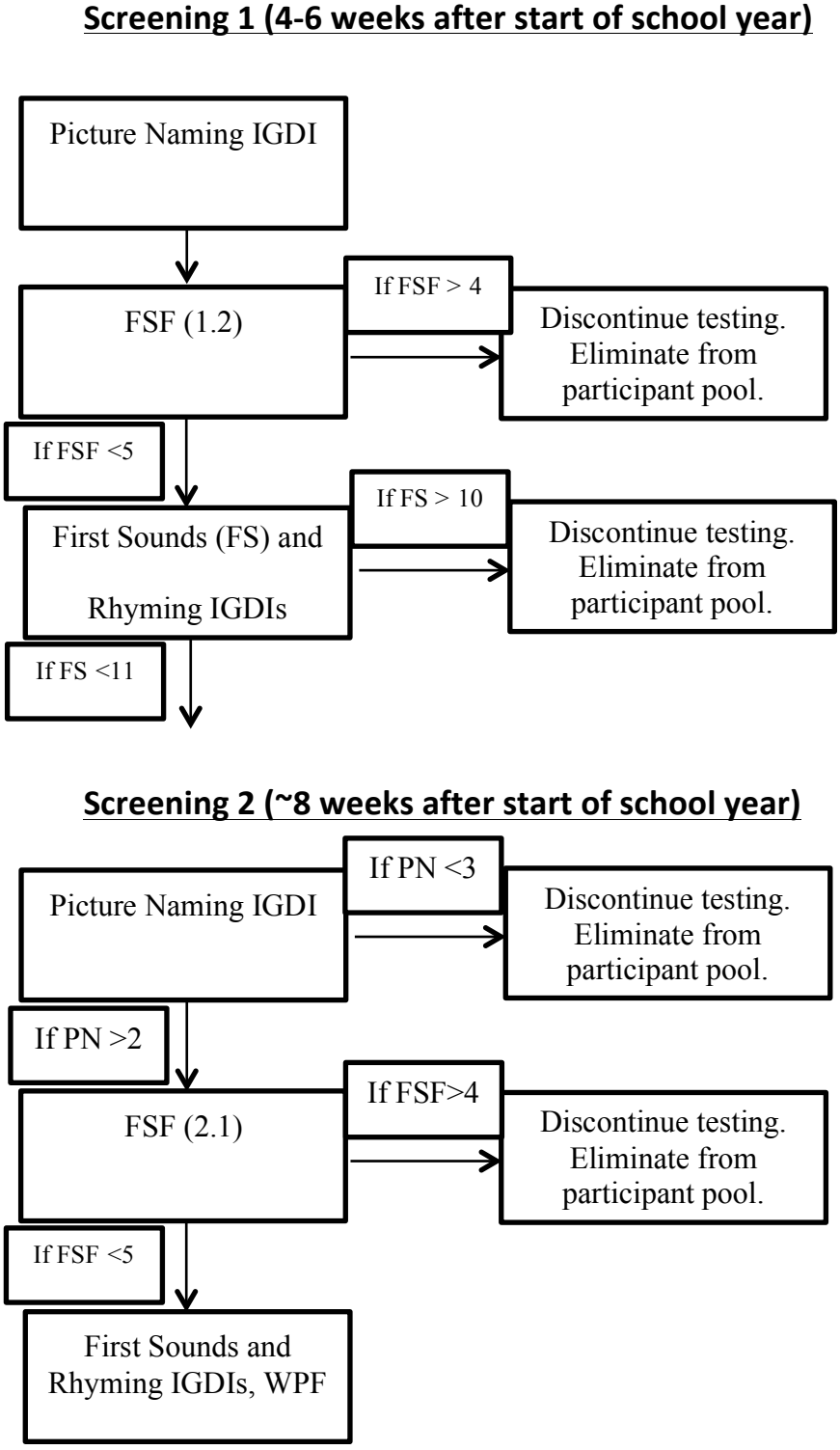
Thank you for considering this request.

If you agree, please check YES below and sign your name:

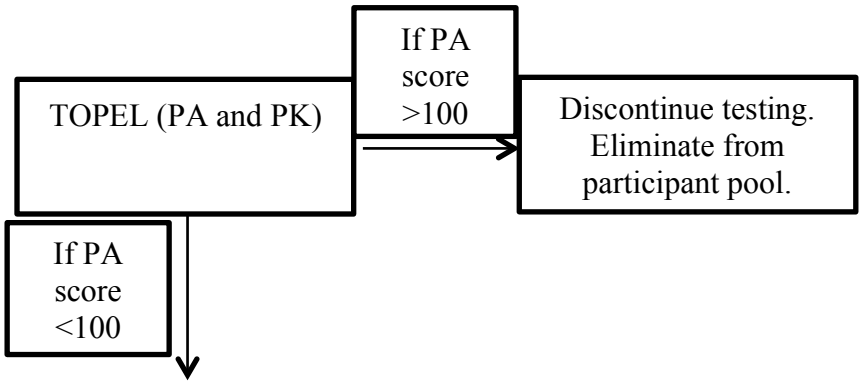
_____ YES, I give permission for videos of interventions in my classroom to be shown for educational purposes, as described above.

Your signature: _____

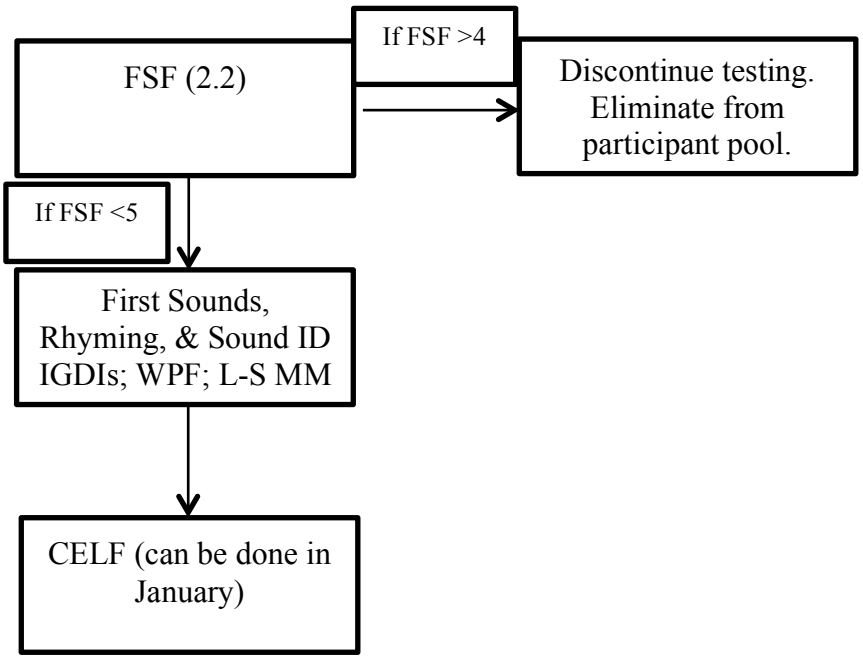
Appendix C: Year 6 Participant Selection Flowchart



Screening 3/Pre-testing 1 (12-14 weeks after start of school year)



Pre-testing 2 (12-14 weeks after start of school year)



Appendix D: Summary of CRTIEC Assessment Measures

Assessment	Description	Purpose	Typical Time to Administer	Administration
Picture Naming IGDI	A brief, individually administered measure (15 items) that asks the child to label pictures	Screening measure	3 minutes	Screening 1 and 2
First Sounds IGDI	A brief, individually administered measure (15-30 items) that asks the child point to pictures that start with target sounds	Screening, progress monitoring, and pre- and post-test measures	3 minutes	Screening 1 and 2, pre-test, progress monitoring, post-test
First Sound Fluency (FSF)	A timed (1 minute) individually administered measure that asks the child to produce initial sounds in words		3 minutes	
Rhyming IGDI	A brief, individually administered measure (15-30 items) that asks the child point to pictures that rhyme		3 minutes	
Test of Preschool Early Literacy (TOPEL)	A standardized test of early literacy; individually administered; only the Phonological Awareness and Print Knowledge subtests will be used	Screening, pre-test and post-test measure	15-20 minutes	Pre-test and post-test
Word Parts Fluency (WPF)	A timed (one minute) individually administered measure that asks the child to produce parts of words	Pre-test and post-test measure	3 minutes	Screening 2, pre-test, progress monitoring, post-test
Sound ID IGDI	A brief, individually administered measure (15 items) that asks the child point to letters that correspond to sounds		3 minutes	Pre-test 2 and Post-test
Letter-Sound ID Master Monitor	An 11-item measure that asks the child to say the name of the letter and the sound it makes for the 11 letters taught in the intervention.		3 minutes	Pre-test 2 and post-test
Clinical Evaluation of Language Fundamentals Preschool – 2nd Edition (CELF)	A standardized test of language development; individually administered; Sentence Structure, Word Structure, Expressive Vocabulary, Concepts & Following Directions, and Basic Concepts subtests will be used	Descriptive measure	10-15 minutes	Pre-test 2, Post-test
Teacher Student Questionnaire	A 5-item measure that asks teachers to respond (yes/no) about children's attendance and classroom behavior	Secondary selection measure	2 minutes	Screening
Examiner Questionnaire	A 3-item measure that asks examiners to rate the level of effort required, child's attention, and child's problem behavior during screening sessions.		1 minute	Screening
Teacher Research Survey	A measure that asks teachers to describe their classrooms, teaching practices in their classrooms, and their teacher training and experience.	Descriptive measure	10 minutes	Beginning of the study
Family Survey	A measure that asks parents to describe their demographics and their regular literacy and language interactions with the child.		10 minutes	Beginning of the study
Teacher Intervention Questionnaire	A 20-25 Likert item measure that asks teachers to provide feedback about their experience implementing the intervention with students in their classroom.	Consumer satisfaction and social validity	10 minutes	End of the study
Vocabulary Mastery Monitor	An 18-item measure of 18 vocabulary words and their definitions	Outcome measure	10 minutes	Post-test

Appendix E: *PA Path to Literacy* Teacher Fidelity of Implementation Checklist and Feedback Guidelines

Teacher ID:		Date of Lesson:		Lesson #:		Fidelity Checker:	

Directions: Circle the number in parentheses that corresponds to the teacher's adherence to fidelity for each item. Calculat e the percentage on page 2. *Note: if a teacher self-corrects (e.g., finds the right materials after showing the wrong ones, re-reads a portion of the script because she lost her place) consider fidelity to be high.*

Criterion	Implemented as described? (Circle one.)	Notes
1. Teacher prepared students for lesson (introduction/rules).	Yes (1), No (0)	

2. Teacher read the lesson script with only minimal changes. *(Follow along with a script and note where changes were made.)*	Read it exactly (4) , Read it with minor changes (3), Read it with major omissions OR additions (2), Read it with major omissions AND additions (1), Read <50% of script (0)

3. Teacher showed visual materials.	Always (1), Often (.75), Sometimes (.5), Never (0)

4. Teacher said parts and sounds of words correctly.						Always [90%] (4), Often [75-89%] (3), Sometimes [50-75%] (2), Rarely [25-49%] (1), Never [<25%] (0)												
	Item 1 Yes No	Item 2 Yes No	Item 3 Yes No	Item 4 Yes No	Item 5 Yes No	Item 6 Yes No	Item 7 Yes No	Item 8 Yes No	Item 9 Yes No	Item 10 Yes No	Item 11 Yes No	Item 12 Yes No	Item 13 Yes No	Item 14 Yes No	Item 15 Yes No	Item 16 Yes No	Item 17 Yes No	Total

5. Teacher provided the right type of feedback.						Always [90%] (4), Often [75-89%] (3), Sometimes [50-75%] (2), Rarely [25-49%] (1), Never [<25%] (0)													
Round 1	Item 1 Yes No	Item 2 Yes No	Item 3 Yes No	Item 4 Yes No	Item 5 Yes No	Item 6 Yes No	Item 7 Yes No	Item 8 Yes No	Item 9 Yes No	Item 10 Yes No	Item 11 Yes No	Item 12 Yes No	Item 13 Yes No	Item 14 Yes No	Item 15 Yes No	Item 16 Yes No	Item 17 Yes No	**Total # Yes/ Total**

These guidelines are intended help research staff provide feedback immediately after observing a teacher delivering a lesson in Unit 1. This is an opportunity for research staff to help ensure high levels of implementation fidelity throughout the study.

BEFORE providing the teacher with feedback, quickly review the *PA Path to Literacy Fidelity of Implementation Checklist* completed during the observation and note things that the teacher **did well** and **areas of improvement**. Show the teacher the completed form if it helps provide specific examples.

1. Ask the teacher if he/she has at least **5 minutes** for you to provide some feedback. If not, plan a time to meet with him/her as soon as possible.
2. **Thank the teacher** for his/her participation in the study. Explain that the purpose of the observation was to make sure that research staff provided enough training and to make sure that he/she is prepared to deliver the rest of the lessons. Ask the teacher to have his/her *PA Path to Literacy Teacher Manual* handy to reference.
3. Ask him/her if any part of the lesson was **challenging** and if he/she has any **questions** about what to do during a lesson.
4. Specifically describe things he/she **did well** during the lesson that you observed.
    a. "I like the way you kept the children's attention on the lesson."
    b. "I noticed that you said all of the word parts correctly."
5. Identify any areas of improvement. Mention **what you observed** and what the **expectations** are.
    a. "I noticed that you did not always provide the right kind of feedback after children responded. Let's review what kind of feedback you might give depending on responses. Let's look at some examples in your *PA Path to Literacy Teacher Manual*."
    b. "I noticed that you forgot to prepare students for the lesson. We think it's important to tell children what you expect of them before you start the lesson. Let's look at the example in your *PA Path to Literacy Teacher Manual*."
6. If fidelity was low (<80%), **make a list** of the areas of improvement. Reference page numbers in *the PA Path to Literacy Teacher Manual* and make sure the teacher has watched the training videos. Plan to observe any teachers with low fidelity scores in the next week.
7. **Thank the teacher** for his/her time. Confirm his/her preferred **method of communication** (e.g., text, email, phone) and explain the process for future fidelity checks (approximately once/week).

Appendix F: Teachers' Use of Behavior Management Strategies Checklist

Teacher:_____ Observation: 1 2 3 4 Date:_____
Observer:_____

Pre-intervention Strategies

1.	Teacher has materials and activities ready prior to children arriving at the table.	YES	NO
2.	Intervention is conducted in a quiet environment appropriate for small-group instruction.	YES	NO
3.	Teacher reviews positively stated behavior expectations or rules with children that tell children what to do rather than what not to do.	YES	NO
4.	Teacher presents expectations or introduces activities with a generally calm, supportive, and positive tone and attitude.	YES	NO
5.	Teacher only continues/begins intervention when children appear actively engaged and interested.	YES	NO
6.	Teacher implements a behavior-based reward system prior to beginning intervention activities AND there is a clear link between the reward system and child behaviors.	YES	NO

TOTAL PRE-INTERVENTION STRATEGIES: (# YES/6) X 100=_____

Within-intervention Strategies

7.	Teacher reminds children of behavior expectations or rules, or connections to rewards at least 3 times throughout the intervention.	YES	NO
8.	Teacher provides positive and descriptive feedback to children on meeting behavior expectations, rules, or following intervention instructions at least 3 times throughout the intervention.	YES	NO
9.	Teacher often addresses children by name in a positive way during the intervention.	YES	NO
10.	Teacher directs encouraging words to the children at least two times during the intervention activities.	YES	NO
11.	Teacher makes eye-contact with children when presenting instructional requests on at least half of the scripted prompts.	YES	NO
12.	Teacher uses voice to emphasize key words/points to children during instruction.	YES	NO
13.	Teacher delivers instruction using an inviting and appropriate pace.	YES	NO
14.	Teacher provides non-verbal reinforcement to children when responding to instructional prompts (e.g., nods head, thumbs up).	YES	NO
15.	Teacher's tone and attitude is generally calm, supportive, and positive throughout the intervention.	YES	NO
16.	Instruction continues to be free from significant distractions throughout the intervention.	YES	NO
17.	Teacher provides a tangible reward at the end of the intervention, regardless of if it was mentioned before or during activities.	YES	NO

TOTAL WITHIN-INTERVENTION STRATEGIES: (#YES/11) X 100= _____

Teachers' Response to Off-Task Behavior

18.	Teacher assists individual children who are exhibiting off-task behavior to become appropriately engaged.	YES	NO	N/A
19.	Teacher effectively redirects children who are engaged in off-task behavior during the intervention.	YES	NO	N/A
20.	Teacher provides descriptive praise to the children when the child(ren) begin on-task behavior.	YES	NO	N/A

TOTAL RESPONSE STRATEGIES:(#YES/#POSSIBLE) X 100_____

TOTAL STRATEGIES (TOTAL YES/TOTAL POSSIBLE) X 100 =_____

SCORING GUIDE

PRE-INTERVENTION STRATEGIES

1. Teacher has materials and activities ready prior to children arriving at the table.

Mark **YES** if: materials appear ready when children arrive at the table
Mark **NO** if: teacher brings children to the table, then begins to assemble materials; teacher leaves the table to gather materials; teacher skims through script while children are waiting at the table.

2. Intervention is conducted in a quiet environment appropriate for small-group instruction.

Mark **YES** if: environment is generally quiet and distraction-free during the introduction of activities.
Mark **NO** if: environment is loud and it appears difficult for children and teacher to communicate; children appear distracted by activities taking place around the intervention area.

3. Teacher reviews positively stated behavior expectations or rules with children that tell children what to do rather than what not to do.

Mark **YES** if: teacher reviews PRIOR to beginning intervention activities and the expectations/rules are clear and concrete (e.g., "Keep your hands to yourself" "Sit in your chair")
Mark **NO** if: teacher waits until after intervention activities have already started and is reacting to child behavior, or if rules are stated negatively (e.g., "No talking", "Don't wiggle"); teacher doesn't clearly define expectations (e.g., Remember work hard/do a good job; you'll get stickers)

4. Teacher presents expectations or introduces activities with a generally calm, supportive, and positive tone.

Mark **YES** if: the teacher's tone sounds inviting, calm, patient, free of frustration the majority of the time during the introduction.
Mark **NO** if: the teacher's voice lacks emotion, is impatient, is negative towards activities or children.

5. Teacher only continues/begins the intervention when children appear actively engaged and interested.

Mark **YES** if: teacher asks if children are ready AND does not move on until she thinks children are ready. The interpretation of whether a child is engaged should be made based on your observation that the child is ready to participate, even if some behaviors are occurring that may appear to be "off-task" (e.g., wiggling, looking elsewhere)
Mark **NO** if: children appear to be distracted, exhibiting off-task behavior such as attending to peers or materials outside of the intervention or talking about other subjects while the teacher is talking; teacher asks if children are ready but moves on even though children do not appear to be paying attention

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6. Teacher implements a behavior-based reward system prior to beginning intervention activities AND there is a clear link between the reward system and child behaviors.

Mark **YES** if: teacher introduces or reminds children of a reward to be given throughout or on completion of intervention activities if children meet behavior expectations **AND** the reward system is clearly linked to specific child behaviors. A clear linkage could include describing specific behaviors that children must meet in order to earn the reward, and/or asking children to repeat what they must do to understand the reward and showing the children the specific reward they are working towards while describing specific behavior expectations that must be met. A reward could be a sticker, candy, or a preferred event/activity (e.g., special center). This does not have to be an entire "system" (e.g., using a gameboard and moving pieces throughout the intervention), but could just be a mention of something to be
Mark **NO** if: teacher introduces or reminds children of a reward to be given throughout or on completion of intervention activities but there is no specific description of behavior expectations children should meet (e.g., "Do a good job and you'll get a sticker" "Work hard and get a sticker").

WITHIN-INTERVENTION STRATEGIES

7. Teacher reminds children of behavior expectations or rules, or connections to rewards at least 3 times throughout the intervention.

Mark **YES** if: teacher provides an explanation or reminder of *positively* stated behavior expectations/rules to a specific child during activities (e.g., "Marco, remember that we need to keep hands to ourselves", "Kelly, this is how we need to use our hands when our friends are talking"). Mark YES regardless of the effectiveness of the reminder/instruction. Mark **YES** if teacher provides a reminder such as "I like the way you all are working and earning your stickers."
Mark **NO** if: teacher provides no individual instruction or reminders of behavior expectations when needed to individual children, or if reminders are given but are negatively stated (e.g., "Marco, stop hitting!", "Kelly, your hands are not to be touching Sam's chair.").

8. Teacher provides positive and descriptive feedback to children on meeting behavior expectations, rules, or following intervention instructions at least 3 times throughout the intervention.

Mark **YES** if: positive descriptive and specific feedback* is provided to children about their behavior related to behavior expectations throughout the intervention (e.g., "Teresa came to the table and sat down ready to listen!", "Juan is helping our friends listen by keep his body still!"). *Often* means at least 3 times spread across intervention activities.
Mark **NO** if: teacher provides negative feedback more often that providing positive feedback (e.g., "Stop moving around.", "I don't like your attitude right now."). Mark **NO** if teacher provides specific positive feedback only at the end of the intervention.

9. Teacher often addresses children by name in a positive way during the intervention.

Mark **YES** if: teacher calls children by name more than 1x when addressing a child during intervention activities. "In a positive way" means that it could be part of providing praise to a child (e.g., "Good job, Robert!") or a proactive strategy to keep a child's attention or encourage participation (e.g., "Remember, Robert, you should use words to answer my questions)
Mark **NO** if: teacher does not call children by name, only does so during introduction and/or data collection, or only does so in a harsh way that is meant to get the child's attention or redirect the child (e.g., "Jane! Jane! Turn around!", "Where were you on that one, Kam?"

10. Teacher directs encouraging words to the children during the activities.

Mark **YES** if: when the teacher speaks to the children outside of the intervention script, words are positive and encourages positive behavior and/or a positive relationship between the child and the teacher or between a child and his/her peers (e.g., "Michael, instead of talking about your dog now, let's talk about it after group." "Ashley, yes, I see you are wearing a pretty dress today. I like it." "Julie, can you help your friend point to the picture?")
Mark **NO** if: teacher does not talk to children beyond the intervention script, or when the teacher does talk to children, it is with a negative tone, negative words, or discourages involvement in activities and with peers. (e.g., "Tanya, stop talking and messing with your friend." "John, the sooner you answer my question the sooner we'll be done")

11. Teacher frequently makes eye-contact with children when presenting instructional requests.

Mark **YES** if: teacher makes an effort to connect with child while presenting scripted instructional prompts; teacher looks up from the script during at least half of instructional prompts.
Mark **NO** if: teacher reads the script without looking up at children at least during half of the instructional prompts

12. Teacher uses voice to emphasize key words/points to children during instruction.

Mark **YES** if: teacher places emphasis on the part of the instructional prompt that would help children key in on how they should answer. (e.g., "Tell me the *first part* of the word sunflower." "Now we're doing to say the *whole* word!" This should happen frequently across the intervention (3-4x) or if not done on original prompts, is provided as part of feedback instructional prompts.
Mark **NO** if: teacher presents instructional prompts with a flat tone of voice, or no emphasis on key parts of prompts, presentation sounds read, or even if words are nicely articulated but key instructional words are not emphasized.

13. Teacher delivers instruction using an inviting and appropriate pace.

Mark **YES** if: teacher delivers instruction in a friendly, inviting way, at a pace that appears to facilitate children's participation and understanding, teacher uses her voice as a tool to encourage children's responding to instructional prompts.
Mark **NO** if: teacher appears to read script, teacher's voice is flat throughout the intervention, the pace is too slow (teacher may have to look down frequently to check her place on the script), or the pace is too fast (teacher reads too quickly; does not read with a tone that is young child-friendly)

14. Teacher provides non-verbal reinforcement to children when responding to instructional prompts.

Mark **YES** if: teacher provides non-verbal reinforcement such as shaking head yes, giving a thumbs up, provides an animated facial expression when children provide a correct answer in response to an instructional prompt across the intervention activities (3-4x)
Mark **NO**: if teacher does not provide any reinforcement beyond what is provided in the instructional script or teacher does not acknowledge children's correct answering throughout the intervention

15. Teacher's tone is generally calm, supportive, and positive throughout the intervention.

Mark **YES** if: the teacher's tone sounds inviting, calm, patient, free of frustration the majority of the time during the intervention.
Mark **NO** if: the teacher's voice lacks emotion, is impatient, teacher appears to not enjoy the activities, teacher makes negative comments about activities or negative comments towards the children

16. Instruction continues to be free from significant distractions throughout the intervention.

Mark **YES** if: children outside of the intervention do not approach the intervention teacher for help/to ask a question, mark **YES** if even though the environment may be noisy, children do not appear to be distracted by activities taking place around them.
Mark **NO** if: teacher implements the intervention in an environment that appears to inhibit children's participation in intervention activities (e.g., volume of media is loud and teacher must frequently redirect children's attention; children are distracted by other children playing beside the area designated for intervention activities. Mark **NO** if the teacher is interrupted by a child/staff member outside of the intervention

17. Teacher provides a tangible reward at the end of the intervention, regardless of if it was mentioned before or during activities.

Mark **YES** if: teacher provides a sticker, piece of candy, stamp, preferred activity, etc., after intervention activities. Score **YES** even if it is not linked to child behavior.
Mark **NO** if: no reward is provided to children upon completion of intervention activities. Mark **NO** if a teacher tells them that they may "go to centers" or other regularly scheduled activity not provided as a reward.

TEACHERS' RESPONSE TO OFF-TASK BEHAVIOR

18. Teacher assists individual children who are exhibiting off-task behavior to beocme appropriately engaged.

Mark **YES** if: teacher engages in an action to encourage a child to be actively engaged, such as a touch on the arm, non-verbal cue, verbal directions; the child does not have to become actively engaged to score a yes; the teacher only has to assist the child in becoming engaged.
Mark **NO** if: teacher does not appear to attempt to help children become appropriately engaged
Mark **N/A** if: all children appear appropriately engaged through the majority of the intervention

19. Teacher effectively redirects children who are engaged in off-task behavior during the intervention.

Mark **YES** if: teacher provides assistance to a child who is distracted and off-task to become re-engaged within the intervention. The child must become actively engaged for this to be scored a YES.
Mark **NO** if: teacher does not attempt to redirect a child who is off-task, or teacher attempts but child does not become re-engaged.
Mark **N/A** if: no children engage in off-task behavior at any time during the intervention

20. Teacher provides descriptive praise when the child begins on-task behavior.

Mark **YES** if: teacher comments descriptively when the child demonstrates the appropriate behavior that is the desired alternative to the previously displayed off-task behavior (e.g., "Thank you for choosing to answer with the group" "Great job sitting looking at me")
Mark **NO** if: teacher does not acknowledge child's on-task behavior; teacher only nods when child re-engages
Mark **N/A** if: children appear actively engaged throughout the intervention and there is no opportunity for teacher to redirect behavior.

Appendix G: Correct Responding Checklist

PA Live Lesson 3a_Correct Responding Observation Script
Blending 2-syllable words; segmenting compound and 2-syllable words; new letter: M
Script **Feedback** ***(instructions for interventionist)***

REVIEW LETTERS (P, M): (Show sheet with letter and point to letter.) **What's the name of this letter? (Name of letter.) What sound does the letter __ make? (1) (/__/.) Say __.**

NEW LETTER (M): (Show sheet with letter M point to M.) **That's the letter M. Say M. (1) The letter M says /m/. Say /m/. (1) What letter is this?** ***(Point to M.)*** **(1) M! What sound does the letter M make? (1) /m/!**

.....

Let's play a game with a word that starts with /m/. Listen: money. Let's say the parts of the word money. Ready? Mon (1) ee. Now you say the word. (2)

+	Yes! Money!
NR	Money. Let's try it again. The parts of the word: mon (1) ee. Now you say the word. (2)
-	Money. Let's try it again. The parts of the word: mon (1) ee. The word: money. Again. The parts of the word: mon (1) ee. Now you say the word. (2)

Write the name/identification of a child and circle the + when a child answers correctly and circle the – if a child answers incorrectly or if a child does not respond to the teacher's prompt.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

I'm going to try to trick you. Listen to me say the parts of a word: nap (1) kin.

Now you say the word. (2)

+	Yes! Napkin!
NR	Napkin. Let's try it again. The parts of the word: nap (1) kin. Now you say the word. (2)
-	Napkin. Let's try it again. The parts of the word: nap (1) kin. The word: napkin. Again. The parts of the word: nap (1) kin. Now you say the word. (2)

Write the name/identification of a child and circle the + when a child answers correctly and circle the – if a child answers incorrectly or if a child does not respond to the teacher's prompt.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

Let's try another one. Ready? Listen to me say the parts of a word: so (1) da.

Now you say the word. (2)

+	Yes! Soda!
NR	Let's try it again. The parts of the word: so (1) da. Now you say the word. (2)
-	Soda. Let's try it again. The parts of the word: so (1) da. The word: soda. Again. The parts of the word: so (1) da. Now you say the word. (2)

Write the name/identification of a child and circle the + when a child answers correctly and circle the – if a child answers incorrectly or if a child does not respond to the teacher's prompt.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

(Show page with footprint, airplane, and mousetrap.) **Listen to me say a word: footprint. *(Put hands together as if you just clapped.)* Now listen to me say the parts of the word: foot (1) print. *(Stretch out a hand one at a time.)* Say the word footprint with me: footprint. *(Put hands together as if you just clapped.)* Now let's say the parts of the word: foot (1) print. *(Stretch out a hand one at a time.)***

+	Yes! Foot (1) print!
- /NR	Foot (1) print. Let's try it again. The word: footprint. ***(Put hands together.)*** Now let's say the parts of the word: foot (1) print. ***(Stretch.)***

Write the name/identification of a child and circle the + when a child answers correctly and circle the – if a child answers incorrectly or if a child does not respond to the teacher's prompt.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

Let's try another one. Listen: airplane. Say the word with me: airplane. *(Put hands together.)* Now let's say the parts of the word: air (1) plane. *(Stretch.)*

+	Yes! Air (1) plane!
- /NR	Air (1) plane. Let's try it again. The word: airplane. ***(Put hands together.)*** Now let's say the parts of the word: air (1) plane. ***(Stretch.)***

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

One more! Listen: mousetrap. Let's say the word: mousetrap. *(Put hands together.)* Now you say the parts of the word mousetrap. (2)

+	Yes! Mouse (1) trap!
NR	Mouse (1) trap. Let's try it again. The word: mousetrap. *(Put hands together.)* Now you say the parts of the word. (2)
-	Mouse (1) trap. Let's try it again. The word: mousetrap. *(Put hands together.)* The parts of the word: mouse (1) trap. *(Stretch.)* Again. The word: mousetrap. *(Put hands together.)* Now you say the parts of the word. (2)

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

Let's look at some more pictures. *(Show page with candy, doctor, and cookie. Point to candy.)* Say the word candy with me: candy. *(Put hands together as if you just clapped.)* Now let's say the parts of the word: can (1) dee. *(Stretch out a hand one at a time.)*

+	Yes! Can (1) dee!
- /NR	Can (1) dee. Let's try it again. The word: candy. *(Put hands together.)* Now let's say the parts of the word: Can (1) dee. *(Stretch.)*

Write the name/identification of a child and circle the + when a child answers correctly and circle the – if a child answers incorrectly or if a child does not respond to the teacher's prompt.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

Let's try another one. Listen: doctor. Say the word with me: doctor. *(Put hands together.)* Now you say the parts of the word. (2)

+	Yes! Doc (1) tor!
NR	Doc (1) tor. Let's try it again. The word: doctor. *(Put hands together.)* Now let's say the parts of the word: doc (1) tor. *(Stretch.)*
-	Doc (1) tor. Let's try it again. The word: doctor. *(Put hands together.)* The parts of the word: doc (1) tor. *(Stretch.)* Again. The word: doctor. *(Put hands together.)* Now let's say the parts of the word: doc (1) tor. *(Stretch.)*

Write the name/identification of a child and circle the + when a child answers correctly and circle the – if a child answers incorrectly or if a child does not respond to the teacher's prompt.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

One more! Listen: cookie. Let's say the word: cookie. *(Put hands together.)* Now you say the parts of the word. (2)

+	Yes! Coo (1) kee!
NR	Coo (1) kee. Let's try it again. The word: cookie. *(Put hands together.)* Now you say the parts of the word. (2)
-	Coo (1) kee. Let's try it again. The word: cookie. *(Put hands together.)* The parts of the word: coo (1) kee. *(Stretch.)* Again. The word: cookie. *(Put hands together.)* Now you say the parts of the word. (2)

Write the name/identification of a child and circle the + when a child answers correctly and circle the – if a child answers incorrectly or if a child does not respond to the teacher's prompt.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

Now I'm going to try to trick you now. Listen: puppy. Say the word puppy with me: puppy. Now let's say the parts of the word: puh (1) pee.

+	Yes! Puh (1) pee!
-/NR	Puh (1) pee. Let's try it again. The word: puppy. The parts: puh (1) pee. Now let's say the parts of the word: pu (1) pee.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

Let's try another one. Listen: bubble. Now you say the parts of the word. (2)

+	Yes! Buh (1) bel!
NR	Buh (1) bel. Let's try it again. The word: bubble. Now you say the parts of bubble. (2)
-	Buh (1) bel. Listen again. The word: bubble. The parts: buh (1) bel. Now you try it with me. The word: bubble. Now you say the parts of bubble. (2)

Write the name/identification of a child and circle the + when a child answers correctly and circle the – if a child answers incorrectly or if a child does not respond to the teacher's prompt.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

Listen: freezer. Now you say the parts of the word. (2)

+	Yes! Free (1) zer!
NR	Free (1) zer. Let's try it again. The word: freezer. Now you say the parts of freezer. (2)
-	Free (1) zer. Listen again. The word: freezer. The parts: free (1) zer. Now you try it with me. The word: freezer. Now you say the parts of freezer. (2)

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

One more word. Listen: window. Now you say the parts of the word.

+	Yes! Win (1) doe!
NR	Win (1) doe. Let's try it again. The word: window. Now you say the parts of window.
-	Win (1) doe. Listen again. The word: window. The parts: win (1) doe. Now you try it with me. The word: window. Now you say the parts of window.

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	+ -	+ -	+ -
Child 2_____	+ -	+ -	+ -
Child 3_____	+ -	+ -	+ -

Total the individual children's correct responses and incorrect responses, then calculate a total across children, resulting in a % of correct responses for each child and for the group.

Child (name or ID)	Total + Responses	Total - Responses	Total +/Total (+ plus -) X 100 = % of Correct Responding
Child 1_____			
Child 2_____			
Child 3_____			
TOTAL	_____	_____	_____

Correct Responding Observation Instructions

1. Mark on each box the child's name or initial, and identification words if needed.

   Child Response 1= Child's response to first instructional prompt provided by the teacher
   Child Response 2= Child's response to second instructional prompt provided by the teacher.
   Child Response 3= Child's response to third instructional prompt provided by the teacher.

2. Circle the + when a child provides a correct response to the teacher. Circle a – when a child provides either an incorrect answer or a non-response answer. Mark a diagonal slash through the words "Child Response 2" or "Child Response 3" if these prompts are not applicable (i.e., the teacher does not provide these prompts).

3. Additional rules/exceptions:
   - The teacher gives a prompt and Children 2 and 3 answer correct, while Child 1 is silent. If a teacher then individualizes a prompt to child 1, mark a diagonal slash through the prompt response box for children 2 and 3. However, if child 2 or 3 answers correctly or incorrectly in response to the teacher's prompt for child 1, give child the corresponding score. If child 2 or 3 does not respond to the teacher's prompt for child 1, then make a diagonal slash through the box for child 2 or 3.

   - If the teacher provides the instructional prompt, and Child 1 and Child 3 answers correct and Child 2 does not answer, then the teacher says the name of Child 2 and she answers correctly while the other two were silent, but then the teacher provides another prompt to the group and they all answer correct: your scoring should look like this:

Child (name or ID)	Child Response 1	Child Response 2	Child Response 3
Child 1_____	(+) -	+ -	(+) -
Child 2_____	+ (-)	(+) -	(+) -
Child 3_____	(+) -	+ -	(+) -

Appendix H: Child Engagement Observation

Student:_____ Date:_____

Teacher:_____ Observer_____ R?_____ Observation: 1 2 3 4

DIRECTIONS: Momentary time-sampling procedures are used to code on-task or off-task behavior using OTB codes . Using a stopwatch set at 10s intervals, observe target child behavior and record the observed behavior if observed at the moment of the "beep" for a maximum of 10min. If the video is longer than 10min, record the first 3 min, the middle 4min, and the last 3 min.

Interval	1	2	3	4	5	6	7	8	9	10	11	12
Code												

Interval	13	14	15	16	17	18	19	20	21	22	23	24
Code												

Interval	25	26	27	28	29	30	31	32	33	34	35	36
Code												

Interval	37	38	39	40	41	42	43	44	45	46	47	48
Code												

Interval	49	50	51	52	53	54	55	56	57	58	59	60
Code												

SCORING GUIDE
ON-TASK BEHAVIOR CODES

All codes are independent. That is, at the time of recording, only one code should be recorded.

1. **(AV)** ACADEMIC VERBAL RESPONSE OR GESTURE: Academic Verbal Response or Gesture is defined by those instances in which the focus child is observed providing an oral response or gesture in response to teacher prompts. This code covers the appropriate motor or manipulative responses using games or materials designed to teach phonological awareness and alphabet knowledge skills. This is an active academic response that occurs when the focus child makes motor or verbal responses. For example:

    a. The teacher asked, "What is the first part of the word, "sunflower," and the child responds with /s/, "sun", "sunflower", /f/, or "flower." The response does not have to be correct in order for the instance to be coded as AV.
    b. The teacher asked the children to point to the letter "B" and the child responds by pointing to a correct or incorrect letter.
    c. The teacher prompted the children to clap and say a word, and the child responds with either or both responses.
    d. The focus child is observed turning over a game board at the time of recording a code
    e. The AV code "trumps" other codes. That is, a child may be both verbally responding (AV) and attending (AA), but only AV should be coded.

2. **(AA)** ACADEMIC ATTENTION: Academic Attention is defined by those instances in which the focus child is observed attending to the teacher or materials during intervention activities. Examples of ACADEMIC ATTENTION include:

    a. The focus child is making eye contact with the teacher at the time of recording
    b. The focus child's head is down looking at pictures on a card or other intervention materials at the time of recording
    c. The focus child is watching a peer answer a question related to intervention activities
    d. The focus child is waiting patiently for the teacher to begin instruction or the teacher is not ready, but the child continues to focus on the teacher.
    e. To be coded as AA, a child should not be engaging in any AV or AT behaviors, but is looking at a teacher or a peer engaged in academic behavior.

3. **(AT)** ACADEMIC TALK: Academic Talk is defined by those instances in which the child is observed verbalizing about their early literacy materials, subject, teacher instructions, or other appropriate topics related to the intervention activities. The content of the conversation must be about the intervention materials or activities. For example:

    a. The teacher is reviewing the letter M and the focus child says, " My name starts with M!"
    b. The child is asking the teacher if he can turn the picture cards to the other side for her.
    c. If the focus child is both attending (AA) to the teacher and asking a question or engaging in other AT behaviors, then AT should be coded

OFF-TASK BEHAVIOR CODES

1. **(C)** COMPETING BEHAVIOR: Competing Behavior is defined as those instances in which the focus child is observed exhibiting behaviors interfering with his/her own intervention activities, interrupting teacher's instruction, or interfering with a peer's learning. Examples of COMPETING BEHAVIOR include:

    a. Tantrums, aggression, crying, vigorously twisting in his/her seat, hitting, yelling, etc.
    b. Manipulating materials at an inappropriate time or in a way that is distracting to self and others.
    c. Ignoring the teacher who has stopped instruction in attempt to redirect the focus child's behavior.

2. **(NP)** NON-PARTICIPATION: Non-participation is defined as those instances in which the focus child is observed clearly not participating in intervention activities but staying in the general area. Examples of NON-PARTICIPATION include:

    a. The focus child putting his/her head down on the table,
    b. Staring the opposite direction of the teacher/group
    c. Talking to/looking at a peer while the teacher is not instructing (e.g., preparing materials, reading the script to herself).
    d. The focus child is attending to the teacher who is redirecting the focus child's behavior (e.g., he pays attention to the teacher while she is tapping him on the arm.
    e. This code should not be used when a child leaves the group. This code is to be used when a child physically remains at the group and is not participating in activities.

3. **(L)** LEAVING THE AREA: Leaving the Area is defined as those instances in which the focus child is observed leaving or having left the group without permission.

4. **(U)** UNAVAILABLE: Unavailable should be coded when the focus child has left the area temporarily with permission of the teacher, such as having left to use the restroom.

Appendix I: Video and Fidelity Observation Schedule

Fidelity Schedule			J AM				B/T AM			B/T PM			
			111 -	151 -	155 -	153 -	103 -	113 -	101 -	108 -	110 -	186 -	181 -
Week Starting	**Day***	**Lesson***	**VC**	**PA**	**PA**	**VC**	**PA**	**VC**	**PA**	**PA**	**VC**	**VC**	**PA**
12/9/2013	M	2a	X				X			X	X		
	T	2b		X	X			X				X	
	Th	2c			video	X			X/video				X/video
	F	Makeup											
12/16/2013	M	3a				X			X			X	X
	T	3b	X				X/video			X/video			
	Th	3c		X/video	X			X			X		
	F - NO SCHOOL												
1/6/2014	M	4a		X	X			X		X/video	X		
	T	4b				X			X				X/video
	Th	4c	X				X					X	
	F	Makeup											
1/13/2014	M	5a	X				X/video					X	X
	T	5b		X	X			X			X		
	Th	5c				X			X/video	X			
	F	Makeup											
1/20/2014	M - NO SCHOOL												
	T	6a				X			X	X			
	Th	6b	X				X				X		
	F	6c		X/video	X/video			X				X	X
1/26/2014	M	**Progress monitoring**											
	T												
	Th												
	F												
2/3/2014	M	7a		X	X			X				X	
	T	7b				X			X				X/video
	Th - NO SCHOOL												
	F	7c	X				X			X/video	X		
2/10/2014	M	8a	X				X/video				X		
	T	8b		X	X			X		X			
	Th	8c				X			X/video			X	X
	F	Makeup											
2/17/2014	M - NO SCHOOL												
	T	9a				X			X				X
	Th	9b	X				X					X	
	F	9c		X/video	X/video			X		X	X		
2/24/2014	M	10a		X	X			X		X/video			
	T	10b				X			X			X	X/video
	Th	10c	X				X				X		
	F	Makeup											
3/3/2014	M	11a	X				X/video					X	
	T	11b		X	X			X		X	X		
	Th	11c				X			X/video				X
	F	Makeup											
3/10/2014	M	12a				X			X		X		
	T	12b	X				X					X	X
	Th	12c		X/video	X/video			X		X			
	F - NO SCHOOL												
3/17/2014	**Spring Break Starts**												